

NETWORK WORLD

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Unisys picks custom net to slash costs

By Paul Desmond
Senior Writer

BLUE BELL, Pa. — Unisys Corp. last week announced it signed a five-year Tariff 12 network deal with AT&T that will cut voice network costs 70% and slash data transmission costs 30% while doubling capacity.

The custom network arrangement promises to save Unisys \$12 million per year over current charges on a myriad of services. Included under the contract terms are T-1 lines, AT&T's Software-Defined Network (SDN), Dataphone Digital Service and international calling through AT&T's recently announced Global SDN service.

Separately, Unisys agreed to be a beta user of AT&T's Accumaster Integrator, according to Bard Haerland, staff vice-president of worldwide telecommunications at Unisys. Accumaster Integrator, AT&T's tool for tying together multiple vendors' net management systems, will initially be used to maintain an inventory of some 5,000 devices and to manage Unisys' AT&T System/85 private branch exchanges, he said.

Eventually, Unisys expects to use the Accumaster Integrator to monitor and control net management products from Timeplex, Inc., Racal-Milgo, Infotron Sys-
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Novell shows off NetWare 386 in a NetWorld demo featuring some 250 networked workstations. See NetWorld stories, pages 2, 6, 7, 19.

Banks fight for the lead in electronic payments race

Major banks offer new services as users move to EDI-based payments to cut time and costs.

By Wayne Eckerson
Staff Writer

Leading banks are jockeying for position in the electronic payment services market, as major corporate customers look to EDI-based payments as a way to cut costs.

Electronic payments will help users eliminate costly and time-consuming paper-based payment systems. With a single EDI message, a user can instruct its bank to pay bills by transferring funds directly to the accounts of thousands of suppliers.

To meet that need, banks are developing electronic payment systems that accommodate a

range of EDI payment formats and customer needs.

A few banks are joining forces with value-added network (VAN) providers to offer comprehensive payment and transmission services, and others plan to launch international EDI payment services.

While only a dozen or so banks offer full electronic payment services, as many as 150 banks are expected to toss their hats into the EDI ring. They are expected to be joined by numerous VAN resellers that already offer a range of EDI services.

According to a recent Coopers
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DG puts teeth into its network strategy

Fleshes out Distributed Applications Architecture with new products, builds on local net blueprint.

By Paul Desmond
Senior Writer

WESTBOROUGH, Mass. — Data General Corp. today is expected to announce software that integrates its minicomputer-based office software with applications on networked microcomputers and provides a graphical interface for users in both environments.

The software will work with Novell, Inc.'s Portable NetWare, which DG licensed last month to position its Eclipse MV minicomputers and Unix-based AViON workstations as servers.

In a preview of the announcements with *Network World* last week, DG also pledged support for Microsoft Corp.'s LAN Manager/X — a portable version of LAN Manager for Unix — on its AViON workstations. In addition, DG said it will provide links between Unix-based applications and those running under DOS, OS/2 or AOS/VS, which is the operating system used by DG's MVs.

Today's announcement put some teeth into DG's Distributed Applications Architecture (DAA), which was announced last February. DAA is DG's blueprint for supporting distributed applications in a multivendor network environment and providing a common user interface

to applications running on different processors and operating systems, said Joe Forgione, DG's director of DAA.

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THE ENNE AWARDS
Honoring The Best Of The Best.



And the winners are ...
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Stage is set for an ISDN showdown

By Bob Brown
Senior Editor

KANSAS CITY, Mo. — With US Sprint Communications Co.'s recent ISDN announcement, the last of the Big Three carriers has bared its ISDN strategy, setting the stage for a major marketing battle that could begin as early as next year.

Although US Sprint, AT&T and MCI Communications Corp. are using different techniques to offer Integrated Services Digital Network services, analysts said the applications they provide will be more important in determining which company lands the most ISDN business.

So far, however, the carriers are promising to deliver fairly similar applications, such as automatic number identification (ANI) for telemarketing.

AT&T is the early ISDN market leader mainly because it was the
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NETLINE

T-1 USERS GROUP wrestles with a controversial BellSouth proposal on so-called "smart jacks." Page 2.

OPEN TOKEN FOUNDATION gets nonmember IBM to take part in a token-ring interoperability demo. Page 2.

LEGAL TASK FORCE readies a

model EDI trading agreement. Page 6.

COMPUTER ASSOCIATES spells out its distributed DBMS plans. Page 7.

LABOR, CAPITAL AND NOW information networks are key to U.S. manufacturers' global competitiveness. Page 32.

FEATURE

Manufacturers automate to fight foreign challenge

By Susan Breidenbach
West Coast Bureau Chief

U.S. manufacturers are fighting for their lives in a global market, squeezed by an ascendant Pacific Rim on one side and the prospect of a unified Europe on the other. Focusing all the Yankee ingenuity they can summon on computer automation seems to be their best hope for survival.

A revitalization of U.S. manufacturing is crucial. Domestic

enterprises that have found it impossible to stay even with foreign competition will not only have to match their offshore counterparts' production, but regain the lead.

"The overall situation is very challenging," said Thomas Martin, a professor of technology and management at Carnegie-Mellon University in Pittsburgh, in a speech to the National Association of Manufacturers.
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INDUSTRY
FOCUS

T-1 users group to study controversial carrier plan

Independent T-1 Users Association says it will review BellSouth Services' 'smart jack' proposal.

By Bob Wallace
Senior Editor

NEW ORLEANS — The Independent T-1 Users Association (ITUA) last week said it will reexamine a BellSouth Services, Inc. proposal to install controversial customer-site network interface devices it can use to test T-1 transmission facilities.

The ITUA filed a letter of protest with the Federal Communications Commission last month opposing deployment of so-called smart jacks containing line build-out (LBO) circuitry. The group took the action to buy time to study how the jacks would affect private networks.

Proponents and opponents of LBO smart jacks presented their positions to the ITUA here last week, after which the association instructed its technical issues committee to recommend a course of action. The committee is expected to draft a letter to its membership explaining the issue and outlining its conclusion within three months.

The issue originally came to a head when BellSouth asked the FCC last December to clarify whether it was permissible to install smart jacks with LBO at customer premises.

Two groups representing equipment vendors — the North American Telecommunications Association and the Independent Data Communications Manufacturers Association (IDCMA) — were the first to protest the plan, saying it returns some network control to the telephone companies.

IDCMA member General DataComm Industries, Inc., a vendor of T-1 multiplexers, later brought the issue to the attention of the ITUA.

Smart jacks are small devices used to terminate T-1 lines. Carriers can use them to conduct remote loop-back tests when trying to isolate line faults.

The internal LBO circuitry can help control signals transmitted to and from customer channel service units. Since the smart jack sits in the transmittal path of customer-originated T-1 signals, an LBO malfunction could cause service interruptions.

Besides the risk of disruption, General DataComm channel service units located more than a few hundred feet from a smart jack will need a repeater to boost the transmittal signal to a level the smart jack can comprehend.

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IBM takes part in first OTF interoperability display

Demo involves token-ring products from 18 firms.

By Susan Breidenbach
West Coast Bureau Chief

DALLAS — The Open Token Foundation (OTF) last week scored a key victory at NetWorld '89 here in getting nonmember IBM to participate in an 18-vendor token-ring interoperability demonstration.

The OTF demonstration showcased a variety of products used in three physical rings bridged together and operating at 4M bit/sec.

The demo involved 13 different types of network interface cards, seven types of media access units (MAU), four different vendors' network servers, four network operating systems and two types of bridges.

It was the first OTF interoperability demonstration, and the 9-month-old organization is regarding it as a major success. OTF Executive Director Colin Mick said there was plug-and-play interoperability at the board level among the different products.

The OTF was established in December 1988 by leading non-IBM token-ring manufacturers in



PHOTO ©1989 LES WOLLAM/GAMMA LIAISON
Dallas' Infomart

what was largely viewed as a defensive move against IBM, which held a 90% market share. Until a couple of weeks ago, OTF members figured IBM would be represented in the NetWorld demonstration only indirectly by IBM products supplied by third parties.

"We're extremely pleased to have IBM officially participate," said Robert Madge, president of

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Briefs

Still waiting. IBM tomorrow is expected to announce its long-awaited data repository, but it will make little or no mention of the repository's role under NetView, according to Shaku Atre, who was briefed on the announcement. Atre is a partner with the Rye, N.Y.-based Atre Computer Assistance division of Coopers & Lybrand.

The repository will work with DB2, IBM's relational data base management system for MVS/ESA, to keep track of all files and applications, according to Frank Dzubeck, president of Communications Network Architects, Inc., a consulting company in Washington, D.C. Users will be able to access any digitized information — text, voice or graphics — by presenting a request to the repository, which in turn will use DB2 to actually find the data.

Under NetView, the repository would be used to store tables of physical and logical net elements, which NetView would then use to track relationships between elements, Atre said. At most, IBM is expected to announce only a statement of direction about the repository's role under NetView, analysts said.

Slimming down. Bell Atlantic Corp. said last week it plans to eliminate a layer of management involving some 1,200 employees in an effort to cut costs and streamline operations. The company will also consolidate some operations, including the Washington, D.C. group headquarters of its Chesapeake and Potomac Telephone Companies. The four C&P operating companies will be merged into other Bell Atlantic organizations and will report to Bell Atlantic President Anton Campanella. The

moves will involve write-offs of certain assets and the reduction of the company's fourth-quarter earnings to about the break-even point. Last year, Bell Atlantic earned \$302.6 million in its fourth quarter.

ISDN and SNA are wed. AT&T is expected to announce tomorrow native support for the Integrated Services Digital Network Primary Rate Interface in its Model 6500 cluster controller, according to a source familiar with the product. Primary Rate Interface support will enable the controller to support 23 concurrent ISDN dial-up terminal sessions and obviate the need for individual terminal adapters for each controller port. Other vendors are expected to announce microcomputer terminal-emulation products for the interface, the source said.

Finding room at the inn. The Hotel Industry Switch Co. (THISCO), a consortium of 16 hotel chains, last week awarded a \$2 million contract to AT&T for network facilities and a computer system that will form the heart of its UltraSwitch network. AT&T will install a Unix-based Pyramid Technology Corp. minicomputer in THISCO's data center in Phoenix that will support leased-line connections between airline reservation systems and the reservation systems of each THISCO member.

With UltraSwitch, travel agents supported by airline reservation systems will be able to access hotel reservation systems to check room availability and special promotions. Travel agents currently use hotel booking information stored on airline systems, which often do not have up-to-date information.

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In the 1990s, expert systems will become required network management tools for users running increasingly complex corporate networks, vendors and industry watchers say.

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Telecommunications

US Sprint Communications Co. recently completed a networkwide upgrade of 41 Northern Telecom, Inc. DMS-250 central office switches to DMS Supernodes, boosting call processing capacity by 45%.

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Data Communications

As facsimile machines grow in importance to businesses, many states have proposed legislation to curb transmission of unsolicited advertisements, so called "junk faxes."

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Local Networking

There was no sign of a slowdown in the local network market as about 20,000 people turned out at NetWorld '89 here last week to sample the wares of more than 300 exhibitors.

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Management Strategies

Companies that implement electronic data interchange should be prepared to integrate the technology into core business operations if they want their investment to pay off.

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CrossComm Corp. recently introduced an Ethernet-to-Ethernet bridge designed to maintain full 10M bit/sec throughput under maximum traffic loads.

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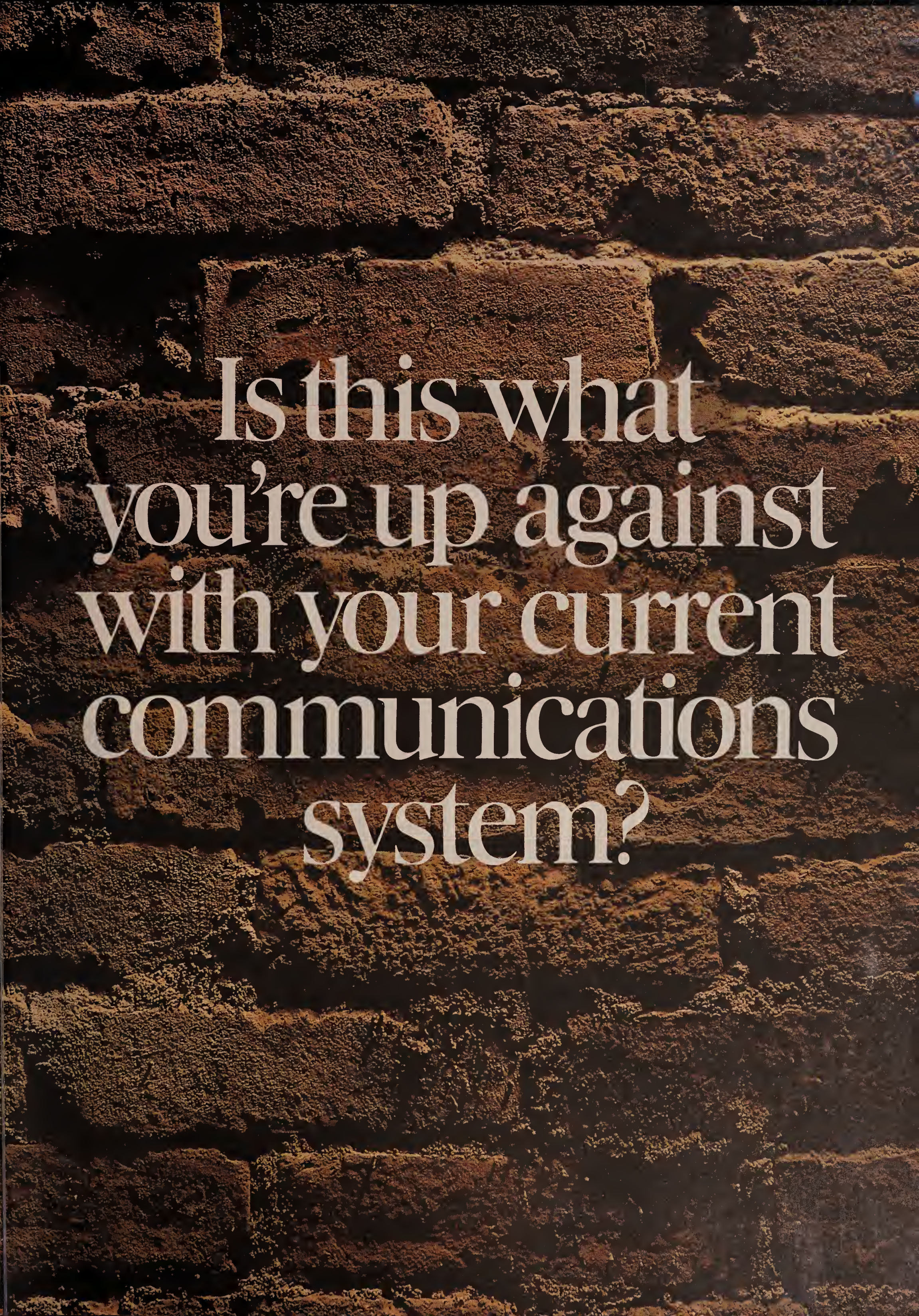
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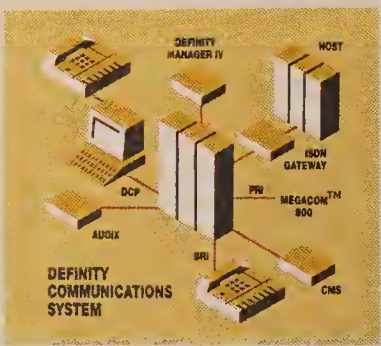


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NetWorld hosts the ENNEs

First annual ENNE awards recognize 7 firms for innovation in enterprise network strategies.

DALLAS — Seven companies last week were honored with the first annual Enterprise Network Excellence (ENNE) awards during a special ceremony at the NetWorld '89 conference here.

The ENNEs, sponsored by *Network World* and NetWorld, recognize companies for innovation in building enterprisewide networks that boost profits and productivity. More than 120 companies competed for this year's awards.

Four awards were given to user companies, and three were awarded to value-added resellers for their work in helping users build enterprise networks. Winners were chosen by a panel

of 15 judges from the user, analyst and vendor community.

Ray Noorda, chairman, president and chief executive officer of Novell, Inc., received the ENNE Pioneer Award for his achievements in the networking industry.

Proceeds from the ENNE awards banquet will be used to create an Enterprise Network Academy, a group of network professionals who will oversee future ENNE award selections and provide a forum for the exchange of information on network strategies.

For information on the academy or the 1990 ENNE awards contact: ENNE Awards Head-



quarters, Suite 2140, 305 Madison Ave., New York, N.Y. 10165.

The 1989 ENNE Award winners were:

Global User Award

Winner: Microsoft Corp., Redmond, Wash.

Supplier: Ungermann-Bass, Inc.

National User Award

Winner: Allegheny Ludlum, Brackenridge, Pa.

Supplier: Novell

Campus User Award

Winner: Southern California Edison Co., San Clemente, Calif.

Supplier: Novell

Single-site User Award

Winner: Leo Burnett Advertising, Chicago

Supplier: Novell

Large-size VAR Award

Winner: Network Management, Inc., Fairfax, Va.

Supplier: Banyan Systems, Inc.

Medium-size VAR Award

Winner: Kramer Systems International, Silver Spring, Md.

Supplier: Novell

Small-size VAR Award

Winner: Systems, Software, Support, Inc., Northfield, Mass.

Supplier: Systems, Software, Support



(From left) Andrew Bialock, Systems, Software, Support, Inc.; Gary Beach, *Network World*; Ralph Ianuzzi Sr., H.A. Bruno; Stephen Yensenosky, Corporate Promotions Group; Kathy Misunas, American Airlines, Inc.; Mike DiBari, Systems, Software, Support; Ray Noorda, Novell, Inc.; Betty Kramer, Kramer Systems International; Tim O'Brien, Network Management International; Nick Rossi, Allegheny Ludlum; Bruce Jacobsen, Microsoft, Inc.; Tim Thompson, Leo Burnett Advertising. Absent: J.E. Groves, Southern California Edison Co.

T-1 users meet to discuss new trends in technology

By Bob Wallace
Senior Editor

NEW ORLEANS — Users and industry pundits last week gathered here at the Independent T-1 Users Association conference to examine emerging trends in the fast-changing T-1 network market.

Attendees at the three-day conference discussed everything from the evolving role of T-1 networks to fractional T-1 services and disaster recovery.

In his keynote address, Jeffrey Held, a principal with Ernst & Young, a Fairfax, Va.-based consultancy, said users' purchasing priorities are gradually changing.

With price and functionality roughly equal among T-1 multiplexer vendors, users are making purchasing decisions based on service, support and vendor stability.

"Users are beginning to ask vendors more business-related questions than technology-related questions," Held said.

Use of T-1 networks is also changing, as are configuration options.

Held said he expects T-1 networks to play an increasingly important role as a means to link geographically dispersed local networks over the next few years.

"LANs are springing up virtually everywhere," concurred conference attendee Robert Heinze, transmission systems manager for McDonnell Douglas Corp. The aerospace company is already using its T-1 backbone to link local nets.

As corporations entrust more mission-critical data to T-1 networks, the need to guard against failure increases, a task made easier with newly available frac-

tional T-1 services, speakers and attendees said.

Fractional T-1 services enable users to lease individual 64K bit/sec T-1 DS0 channels or groups of channels at a dramatically lower price than traditional data services or full 1.544M bit/sec T-1 digital pipes (each T-1 supports 24 DS0s).

Replacing underutilized T-1 links with fractional T-1 services will provide savings customers can use to install other fractional T-1 links to turn point-to-point nets into more reliable mesh networks, Held said.

But many users have been slow to build T-1 mesh nets. "Users usually start out building a T-1 backbone to save money and try to squeeze every last dollar out of the network," Held said. "They discover later that they put themselves in a very precarious situation with regard to reliability."

"A line failure in a network optimized for cost that uses a star topology can cost you so much in downtime that you totally wipe

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ABA readies model EDI trade pact

By Barton Crockett
Senior Editor

CHICAGO — An American Bar Association (ABA) task force has nearly completed work on a model electronic data interchange trading agreement designed to make it easier for users to enter into EDI partnerships with other companies.

The document, titled "A Model Form of EDI Trading Partner Agreement," contains ideas from U.S. legal experts on how to set up fair and enforceable EDI trading agreements.

It is being prepared by the Electronic Messaging Services (EMS) Task Force of the ABA, based here, and should be ready for public distribution by the end of October.

EDI trading agreements are contracts that outline exactly how companies will use EDI in doing business with one another. Many users say the agreements are a vital component of a healthy EDI partnership, helping ensure that each party understands what is expected and that EDI transactions are legally binding.

Yet establishing EDI trading agreements can be difficult because many of the legal questions surrounding EDI remain unresolved.

For instance, it is unclear whether so-called electronic signatures placed on EDI documents can be used in place of written signatures on paper documents.

Users are often confused about who shoulders responsibility and what steps can be taken if EDI documents are altered during transmission ("Signed, sealed and . . . delivered?" NW, June 27, 1988).

20M bit/sec Arcnet bows at NetWorld

By Susan Breidenbach
West Coast Bureau Chief

DALLAS — Datapoint Corp., Standard Microsystems Corp. (SMC) and NCR Corp. last week introduced a 20M bit/sec version of Arcnet at NetWorld '89 here.

ArcnetPlus is interoperable with the 2.5M bit/sec version of Arcnet, which has an installed base of about two million nodes. Developed by Datapoint, the ArcnetPlus technology has been licensed to SMC and NCR, which will produce the ArcnetPlus chipsets.

The first ArcnetPlus network

That confusion can deter companies from employing EDI, according to users and legal experts.

"Lawyers have to reinvent the wheel each time they sit down [to draft an EDI trading agreement]," said Lee Foote, manager of EDI at E.I. du Pont de Nemours & Co. "The legal questions and myriad of problems can discourage some companies."

Bringing order

In publishing the model trading agreement, the EMS Task Force hopes to sweep aside some of the confusion.

The document covers key issues users must address and terminology they should use when drafting EDI trading agreements.

"A Model Form of EDI Trading Partner Agreement" will be designed so that firms interested in using EDI can simply pull terms and clauses directly from the document and plug them into their own EDI trading agreements.

It will be the first comprehensive model for EDI trading agreements published in the U.S., according to Michael Baum, chairman of the EMS Task Force and president of Independent Monitoring, a Cambridge, Mass.-based consultancy.

"Even if a company chooses not to implement an EDI trading agreement, I would recommend that they at least read this document to be cognizant of the issues," Baum said.

According to Foote, releasing this kind of document will make life easier for users interested in establishing EDI networks.

"It will be like being able to go down to the store and buy standard [purchase order] forms," Foote said. "You won't have to go out and design everything yourself."

For information on "A Model Form of EDI Trading Partner Agreement," contact Independent Monitoring at 33 Tremont St., Cambridge, Mass. 02139; (617) 661-1234. □

adapters from SMC, NCR and their OEMs are expected to reach users by mid-1990.

Some analysts had warned that Arcnet could lose market share if it was not enhanced to support higher throughput ("Will Arcnet be an endangered species?" NW, June 12).

"The products are a way off, but the announcement is important because it gives current Arcnet users a level of comfort," said Patrick Corrigan, president of The Corrigan Group, a consulting company in San Francisco. "It's an indication that Arcnet will maintain its viability."

ArcnetPlus provides eight times the performance of first-generation Arcnet and will operate over coaxial, unshielded twisted-pair and fiber-optic media. It retains the same simplicity, low packet overhead and ease of

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Software development kit wins key vendor backing

By Laura DiDio
Senior Editor

DALLAS — As expected, Novell, Inc., Sun Microsystems, Inc. and Netwise, Inc. last week announced a software development tool kit here, but in a surprise development, the effort was backed by Novell rival 3Com Corp.

Under the agreement — the most significant one of its kind to date — Novell, Sun and Netwise will create a common software development tool kit that will enable developers to build distributed applications ("Novell, Sun work toward Remote Procedure Call interoperability," *NW*, Sept.



Sun's Larry Garlick announces the joint development agreement.

CA uncovers details of its distributed DBMS strategy

Company plans to develop variety of software.

By Jim Brown
Senior Editor

GARDEN CITY, N.Y. — Computer Associates International, Inc. (CA) last week unveiled its distributed data base management system strategy, saying it will develop DBMS software for a variety of processors that will be integrated with its existing mainframe products.

Along with the news that it had completed its acquisition of Cullinet Software, Inc., CA announced it will build microcomputer-, local network- and mini-computer-based DBMSs that will work with Cullinet's mainframe-based IDMS software — which has been renamed CA-IDMS/DB — and its own host-based CA-Datcom/DB — which CA acquired when it bought Applied Data Research, Inc.

The products are part of CA's Application Construction Environment (CA-ACE), CA's blueprint for distributed DBMSs and application development.

CA also said it will enhance CA-IDMS/DB to support SQL, a standard method for communications between applications and a DBMS. A version of CA-Datcom/DB supporting SQL is currently in beta test. Both CA-IDMS/DB and CA-Datcom/DB will continue to support CA's and Cullinet's data access methods.

The first new product under CA-ACE is called CA-DB/PC, which will enable users of MS-

DOS-based microcomputers to store data locally and access CA-Datcom/DB data on IBM mainframes. In the future, the product will support access to CA-IDMS/DB data. An OS/2-based version of CA-DB/PC is already being developed.

CA is also working on server-based software called CA-DB:Server, which will work like Ashton-Tate Corp. and Microsoft Corp.'s SQL Server. CA-DB:Server will support a client/server architecture that enables local net-attached microcomputers running CA-DB/PC applications to share data stored on the server. CA-DB:Server will initially run under Novell, Inc.'s NetWare.

Also under the CA-ACE umbrella is a renamed version of Cullinet's Enterprise:DB VAX that runs on Digital Equipment Corp. VAXes. Now called CA-DB/VAX, the software enables VAX users to access CA-IDMS/DB data.

Lastly, CA said it will develop DBMSs for minicomputers that run an AT&T System V-based version of Unix. That software will enable Unix-based systems to access mainframe-, VAX- or micro-computer-based DBMSs.

Each of CA's DBMSs will support IBM's LU 6.2 communications protocols, providing program-to-program communications between applications. Those DBMSs will make use of existing intersystem connections, such as gateways between DEC's

11). The pact marks the first time rival local net vendors have agreed to back the development of a common developer's tool kit. Besides Novell and 3Com, the effort has been endorsed by Banyan Systems, Inc. and AT&T.

The forthcoming tool kit, called the Common Distributed Computing Platform (CDCP), will support Sun's RPC Library and Remote Procedure Calls used by Novell.

The availability of CDCP, slated for delivery in the first half of 1990, will enable developers to build applications without writing to particular network operating systems or transport protocols, said David Fowler, director of Sun's PC Distributed Systems Division.

Analysts at last week's announcement were impressed with both the technology and the overwhelming support it has received from local network, software and systems vendors alike.

"It's a real good move for all concerned," said Mary Modahl, an analyst at Forrester Research, Inc., a consulting firm in Cambridge, Mass. "Novell gets relief from [the war] over Named Pipes because, if the RPC technology

becomes a standard, then applications will run on NetWare nets as well as they do on LAN Manager and Unix nets. That will make end users very happy.

"If the RPC technology becomes widely used — and I think it will because Sun's Libraries of calls and subroutines for net services will be made available to everyone — it will speed the availability of applications," she said.

It will also open the application field to small developers that have not had the means to delve into the lower levels of the different networks and license various code, Modahl said. "Particularly in data base applications, it's

been a closed game, unless you're a big software company with large resources," Modahl said.

At a press conference last Tuesday hosted by Novell, Sun and Netwise, the companies said CDCP will be based on Netwise's RPC TOOL developer's kit.

The new kit will let programmers write applications to one common application programming interface without worrying about underlying transport protocols, Fowler said. The resulting distributed applications will run across processors in Novell NetWare, Sun Open Network Computing/Network File Sys-

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Avanti enters the low-end mux market

By Paul Desmond
Senior Writer

NORWOOD, Mass. — Avanti Communications Corp. last week introduced a low-end intelligent T-1 multiplexer as part of a plan to attract Fortune 2,000 customers that need to link three to 10 locations.

The new Open Network Exchange (ONX) 2000 is central to the company's strategy to focus on the low-end market after conceding the high end to competitors Timeplex, Inc. and Network Equipment Technologies, Inc. (NET), said Robert Degan, Avanti's recently appointed president and chief executive officer.

The debut of the ONX 2000 culminates a six-month corporate reorganization that involved relocating the company's headquarters and a wholesale management change. Besides Degan, there are new executives at the helm of Avanti's engineering, sales and financial operations.

The reorganization also led Avanti to the conclusion that it needs a strategic partner like NET has in IBM, Degan said. The company has actively begun seeking a company with strong international marketing channels.

While contending with the reorganization, Avanti also had to spend six months working out bugs in ONX software that, in some situations, caused multiplexers to malfunction, said Jack Kelly, director of marketing.

Degan said the bugs have been eliminated and customers have given ONX positive performance reports and ordered more of the devices.

The company now hopes it has left its problems behind and says it is ready to roll out new products.

The introduction of the ONX 2000 will be followed by more announcements pertaining to Avanti's point-to-point T-1 products at the Tele-Communications Association, Inc. show in San Die-

go next week, according to Kelly.

The ONX 2000 supports up to 12 T-1 lines and up to 250 voice or data ports. Input ports are supported by subrate digital multiplexing (SDM) modules and high-speed data modules. The four-port SDM module supports port speeds of 2,400, 4.8K, 9.6K and 56K bit/sec. The two-port high-speed module supports 56K, 64K and 1.544M bit/sec.

By contrast, the previous low-end ONX, the 5000, supports up to 16 T-1s and 280 ports, Kelly said. The 2000 is field-upgradable to the 5000.

Like other ONX multiplexers, the ONX 2000 supports adaptive rerouting, which means it can route around failed nodes using any available path as opposed to following a preconfigured route, Kelly said.

For network management, the product includes configuration and diagnostic capabilities, and can display the status of links from an ASCII terminal attached to any node in a network, according to Kelly.

"We think the 2000 will be our flagship product because we believe that it specifically addresses a market that is opening up," he said.

That market is for Fortune 2,000 companies that previously could not afford T-1 nets but now are looking for so-called hybrid networks. Those nets combine private networks with services offered by carriers — for instance, fractional T-1 and M24.

Analysts said the strategy of targeting potential hybrid net customers was a good one, especially since, as Degan acknowledged, Avanti would have trouble competing against larger competitors such as Timeplex and NET.

But analysts cautioned that Avanti will not win that business on its products alone.

"Avanti needs to demonstrate that it has the corporate infrastructure that will be there when the customer needs it," said Timothy Zerbic, a principal at Vertical Systems Group, a Dedham, Mass., consultancy.

Available now, the ONX 2000 starts at \$19,975; SDM and high-speed modules range from \$2,000 to \$5,000. □

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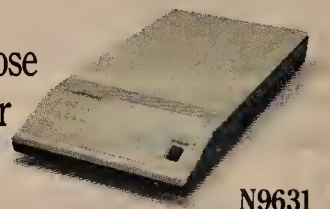
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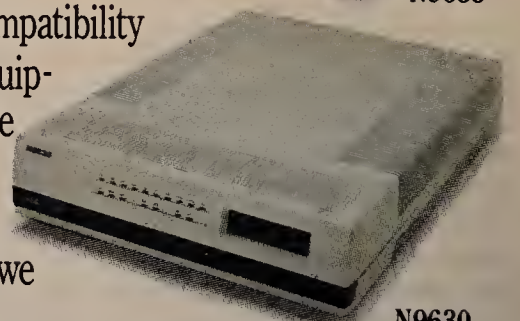
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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

The worldwide market for EDI products and services reached \$79.5 million in 1988 and is expected to more than double to \$1.8 billion by 1995, according to a recent study by Market Intelligence Research Co. in Mountain View, Calif. "EDI is expected to be as commonplace as the telephone within the next 10 years," the study said.

People & Positions

Joseph McQuaid last week was named vice-president of sales and marketing by **France Telecom, Inc.** in New York.

McQuaid is the first American to hold an executive-level position at France Telecom. His familiarity with the U.S. telecommunications market is expected to help France Telecom in its push to become the leading international telecommunications carrier in the U.S. McQuaid will be responsible for overseeing the sales and marketing efforts of France Telecom's North American operations.

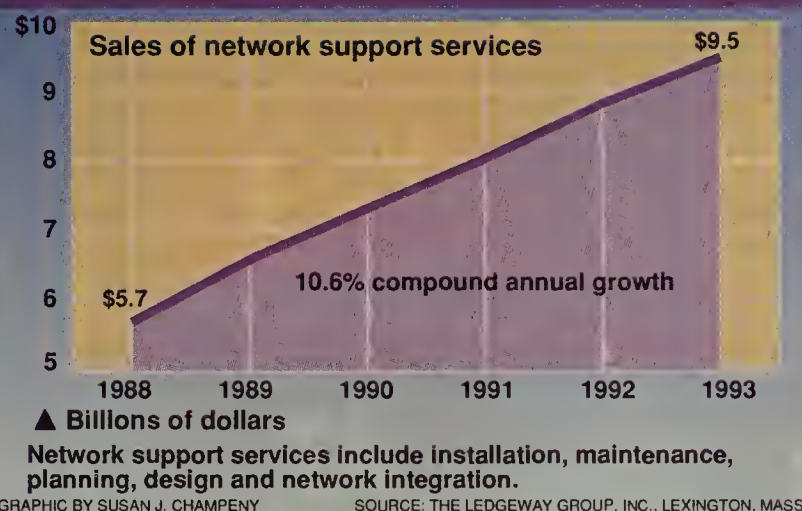
Previously, he was director of carrier sales at Teleport Communications Group.

Timothy Harden last week was named executive vice-president and chief operating officer of **PacTel Business Systems** in Walnut Creek, Calif.

In his new position, Harden will be responsible for overseeing sales and service operations at PacTel Business Systems, a subsidiary of Pacific Telesis Group that sells key systems, Centrex service and private branch exchanges to midsize and small businesses.

Previously, Harden was general manager of Los Angeles Metro Customer Services for Pacific Bell, a Pacific Telesis operating company. □

Net support service sales to grow



McData takes its network products directly to users

Controller manufacturer goes beyond OEMs.

By Gail Runnoe
Washington Correspondent

BROOMFIELD, Colo. — In an effort to capture market share, McData Corp., a longtime OEM of terminal controllers, has begun selling its products directly to end users in the U.S.

McData markets a line of IBM 3174-compatible controllers, the LinkMaster 4174 series, which it has sold on an OEM basis for the past seven years through firms such as Harris Corp., Idea Courier, Inc. and Memorex Telex Corp.

The series comprises 14 models, including entry-level controllers that support four coaxial devices and high-end controllers that support up to 64 synchronous devices, 24 ASCII devices and one token-ring gateway.

The company will also market a new line of channel extenders and network processors introduced as part of its strategy to sell to end users.

Aggressive enough?

While it will continue to sell exclusively through other vendors in Europe, McData said it decided to expand its U.S. distribution strategy because the American OEMs have not been aggressively pushing its products.

Bruce Brown, vice-president of marketing, sales and services at McData, said the market for controllers has changed dramatically over the years.

"In the old days, users wanted to buy terminals and associated controllers from one company. Since McData didn't sell terminals, its only chance to sell products was to rely on companies that did," Brown said.

Now, however, more and more users are networking personal computers instead of linking dumb terminals to a host.

"Personal computers have

driven users to see the controller purchase by itself," Brown explained.

By selling strictly on an OEM basis in the U.S., McData wasn't able to take full advantage of this shift. "We felt we weren't getting our fair share here; so we're going to go after it ourselves."

Leslie Lord, a senior analyst at International Data Corp., a market research firm in Framingham, Mass., estimated that McData has about 12% of the U.S. controller



McData's Bruce Brown

market. Although she believes the new distribution strategy will likely increase that share, she could not estimate by how much.

"No one can market the McData products as well as McData can. By going direct, they can only continue to chip away at IBM's [approximate 70%] market share," she said.

The only alternative

Lord added, however, that in the changing marketplace, McData had no alternative but to pursue direct end-user distribution. "The ultimate reason for this strategy is the consolidation of U.S. 3270 vendors," she said.

Lord cited the recent merger of Memorex and Telex. While the new company is currently McData's largest OEM customer, she said, Memorex Telex has also

(continued on page 11)

Future of net mgmt. lies in expert systems

Vendors gear up to meet users' growing need for automated, intelligent network control tools.

By Bob Brown
Senior Editor

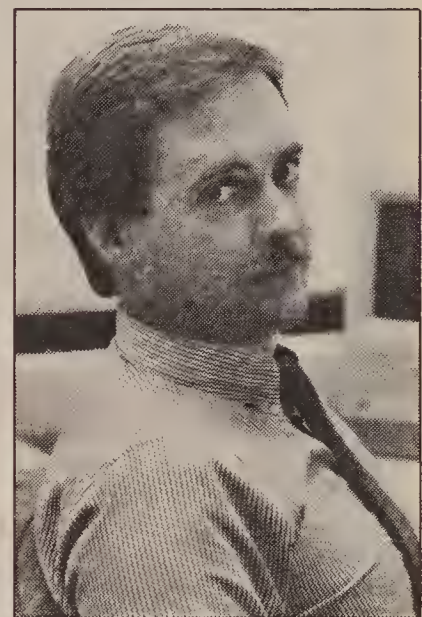
In the 1990s, expert systems will become required network management tools for users running increasingly complex corporate networks, vendors and industry watchers say.

Demand for expert network management systems is being fueled both by users' need to maintain control over rapidly expanding multivendor nets and the difficulty of hiring and maintaining qualified network support staffers who can oversee fast changing network technology.

Net management products and services that incorporate expert systems technology promise to ease the task of network management by automatically handling the bulk of routine problems and aiding human experts in solving the more difficult ones.

In response to growing user interest, net management vendors including IBM, Digital Equipment Corp. and Harris Corp. (see "Harris exits expert systems users group," page 11) are delivering or working on network control products and services that utilize expert systems technology.

Expert systems fall under the broad category of artificial intelligence technologies. Typically, they are defined as systems capable of solving problems by drawing on a data base, or knowledge base, of information collected from experts in a particular field.



NET's Mark Sutter

Every vendor has its own definition of expert systems, and many vendors question the validity of competitors' claims that their products are based on expert systems technology.

(continued on page 11)

INDUSTRY BRIEFS

Novell, Inc. reported a 13% increase in net revenue and a 2% decrease in earnings for the third quarter ended July 29.

The financial report was based on the consolidated financial results of Novell and its newly acquired subsidiary, **Excelan, Inc.** According to Novell, onetime costs associated with the Excelan merger were offset by a onetime taxable gain on the sale of Novell's publication division to McGraw-Hill, Inc.

Net revenue for the third quarter was \$101.8 million, compared to net revenue of \$90.4 million for the similar quarter in 1988. Net income was \$11.8 million, down slightly from last year's \$12.1 million.

The company said the decline in earnings was due in part to a \$5 million decrease in hardware revenues compared to the previous quarter. This is a result of the company's continuing strategy to shift certain hardware manufacturing operations to independent suppliers.

"As hardware products become commodity products, they no longer fit our strategy as a network computing software systems company," said Raymond Noorda, Novell president and chief executive officer.

The local net maker's gross profit margins — the percentage of gross sales that is profit — increased to 66%. This is a 10% increase from the corresponding period last year, as software sales became a larger percentage of revenue. Novell said third-quarter revenue was also affected by the company's May announcement of NetWare 386, which it believes slowed orders for its high-end SFT NetWare V2.15 product.

(continued on page 11)



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Future lies in expert systems

continued from page 9

pert systems. However, they agree on the basic functions the current generation of expert network management offerings can perform.

Usually, an expert net management system or service will alert a network operator that a problem exists, identify the problem and suggest solutions to the network manager or automatically take steps to resolve the problem itself (see graphic below).

"Users are looking for network management systems that do a lot of things automatically that they used to have to do manually. Expert systems can provide this," said Bill Victoria, director of network management systems marketing for General Data-Comm, Inc. in Middlebury, Conn.

In the future, expert systems will actually learn how to manage a network by referring to previous problems they have solved, using what an executive from one company ironically termed "real artificial intelligence."

All the vendors contacted by *Network World* claim to provide some sort of expert system-based network management offering. Some offer services in which an expert system helps manage a customer's network.

Network Equipment Technologies, Inc. (NET) in Redwood City, Calif., for example, an-

nounced a service in April called the Expert Fault Management Service ("NET unveils T-3 mux in product blitz," *NW*, April 17). The expert system that supports the service helps NET offer customers around-the-clock net surveillance and troubleshooting. The system identifies net faults through deductive reasoning and reference to a software model of the customer's network.

The expert system software runs on a workstation at either the customer site or an NET Technical Assistance Center. An NET Series 5000 Network Management System serves as a gateway into the customer's net, said Mark Sutter, engineering project manager for NET's Network Management Systems division.

"By taking care of fault management for customers, we allow them to better leverage what staffing they have to monitor the network," Sutter said.

DEC offers a similar arrangement under its NETsupport service plan through which the vendor can oversee a customer's network from its customer support center in Colorado Springs. There, expert systems are used to solve net problems, said Deb Curtis, net management marketing manager for DEC's Networks and Communications Group.

DEC has found that expert systems are often only as good as the

know-how a user transfers into the data base, and many users have difficulty putting their network management expertise down on paper, Curtis said.

"I'd expect more network management products using expert systems to come out in the next few years as network management problems become better understood," she said.

IBM also uses expert systems to help users manage their networks and monitor net performance from its technical offices, said John Waclawsky, a senior developer in IBM's National Service Division in Gaithersburg, Md. ("IBM offers peek at SNA expert system," *NW*, June 26).

IBM technicians use a personal computer-based expert system to identify problems on Network Support customers' Systems Network Architecture networks and to recommend remedial action, he said. IBM is considering promoting its expert system as a separate service — apart from Network Support — over the next year.

Marty Grubin, senior product manager for Digital Communications Associates, Inc.'s Open Network Management System, said he foresees "an absolute need for expert systems in network management" starting in about the third quarter of next year.

By that time, there will be products for managing different vendors' net management systems based on recommendations by the Open Systems Interconnection/Network Management Forum, Grubin said. DCA is a member of the forum.

"When it comes to linking disparate network management systems together — that's where the fun begins," Grubin said.

Future expert system-based net management products will likely learn from their own experiences, vendors said. Currently, the expert systems are only as smart as the users who establish their knowledge bases.

Users are crying for a network management product that would look back at solutions to previous network problems and quickly apply that knowledge to fixing other problems, said Ginny Fo-

Harris exits expert systems users group

MELBOURNE, Fla. — Harris Corp., a pioneer in the use of expert systems for network management, has bowed out of the users group it created as a forum for sharing its expert system technology.

Harris, a computer and communications equipment maker, began work on its Network Problem Determination Expert System (NPDES) about 2½ years ago when it could not find an affordable multivendor net management system. Harris developed NPDES to assist operators in controlling its internal IBM Systems Network Architecture net supporting 6,000 terminals ("Expert system monitors nets," *NW*, Sept. 7, 1987).

Harris' internally developed net management tool was so effective it decided to share the technology with other users. A users group was formed about a year ago to help Harris enhance the system. Participants in the group got free use of the expert system; in exchange, members pledged to share any enhancements, such as new features to the NPDES knowledge base, that they made to the package ("Harris offers to give away expert net control system," *NW*, Sept. 12, 1988).

But earlier this year, Harris signed an agreement with InterData Computer Services, Inc. in Maitland, Fla., to market its network management system. This agreement effectively spelled

the end of the users group.

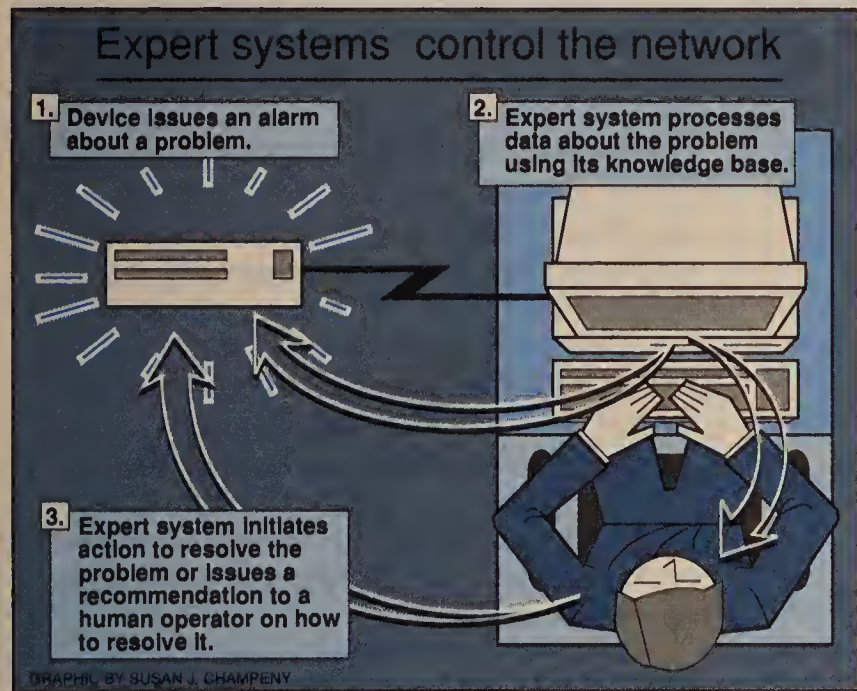
Last month, Harris sent a letter to members of the users group informing them that it was pulling out.

Dolly Matejic, who developed NPDES — now called the Network Expert Advisory Tool (NEAT) — said Harris would have been in an awkward position as a member. The company could have profited from future input by users group members, but members are banned from selling products based on the expert system. Users group members are still allowed to use the base expert system tool given to them by Harris, but they would have to buy an enhanced version, Matejic said.

Another reason that Harris pulled out is that Matejic wound up spending most of her time at work running the users group, which at last count had 73 members. Harris was offering her services at no cost, she said. In fact, Harris had to bring in a new development person to replace her. Currently, Matejic serves as a first-level technical support contact for users of NEAT.

As for the future of the users group, it is likely that the organization will be disbanded. Some users with common interests have banded together on a much smaller scale, but no one user has taken a leadership role to keep the organization alive, Matejic said.

— Bob Brown



McData takes net products to users

continued from page 9

started to develop its own line of controllers to replace the McData line.

According to Lord, one of McData's other big OEM customers, Harris, is up for sale, jeopardizing that relationship.

"There are no more OEMs for McData to sign up, and the current OEMs are in jeopardy," Lord said.

Analysts warned that McData will have to try to maintain its OEM relationships in the short-term to "guard its revenue stream during the transition." OEMs won't like the new strategy,

she said, because they'll be competing with McData for business.

McData's new product offerings — the LinkMaster 5200F and 5200T channel extenders, and the LinkMaster 6100C network processor — will also open up new markets for McData.

Larry Cormier, manager of marketing communications at McData, said these products leverage McData's existing controller technologies. "Our real strengths are channel technology, SNA and NetView. We had to know all those things for our controller business," he said.

McData hopes to capture 30% of the channel extender and network processor market, Cormier added. ■

Industry Briefs

continued from page 9

Samsung Information Systems last week announced it will give free video graphic array monochrome monitors to customers who purchase any of four different **Samsung/Novell, Inc.** bundled local network packages during October.

Under the promotion — dubbed LAN ValuePak — \$1.5 million worth of monitors will be given away, Samsung said, with packages that include Samsung's PCterminal/286 diskless workstations and 386AE file servers, and Novell's ELS II NetWare, Advanced NetWare or SFT NetWare. The packages entitle users to five,

nine or 13 free Samsung monitors.

Steven Kohn, national sales manager of Samsung personal computer products, said the packages were designed for small businesses and corporate departments, and 100% Samsung/Novell compatibility is guaranteed.

Oracle Corp., a Belmont, Calif.-based supplier of data base software and services, has formed a new Network Products Division.

Smokey Wallace, former director of Digital Equipment Corp.'s Western Software Laboratory, was recruited by Oracle to head up the new division.

A key to the division's strategy

will be SQL*NET, remote procedure call software that allows Oracle client applications to communicate with Oracle SQL data base servers and allows the data base servers to communicate among themselves.

SQL*NET provides transparent access to Oracle data bases across a number of protocols, including Advanced Program-to-Program Communications/LU 6.2, DECnet, Transmission Control Protocol/Internet Protocol and Sequenced Packet Exchange/Internetwork Packet Exchange (SPX/IPX).

Oracle said the division's first products will be available in the fourth quarter through Oracle's existing distribution channels. ■



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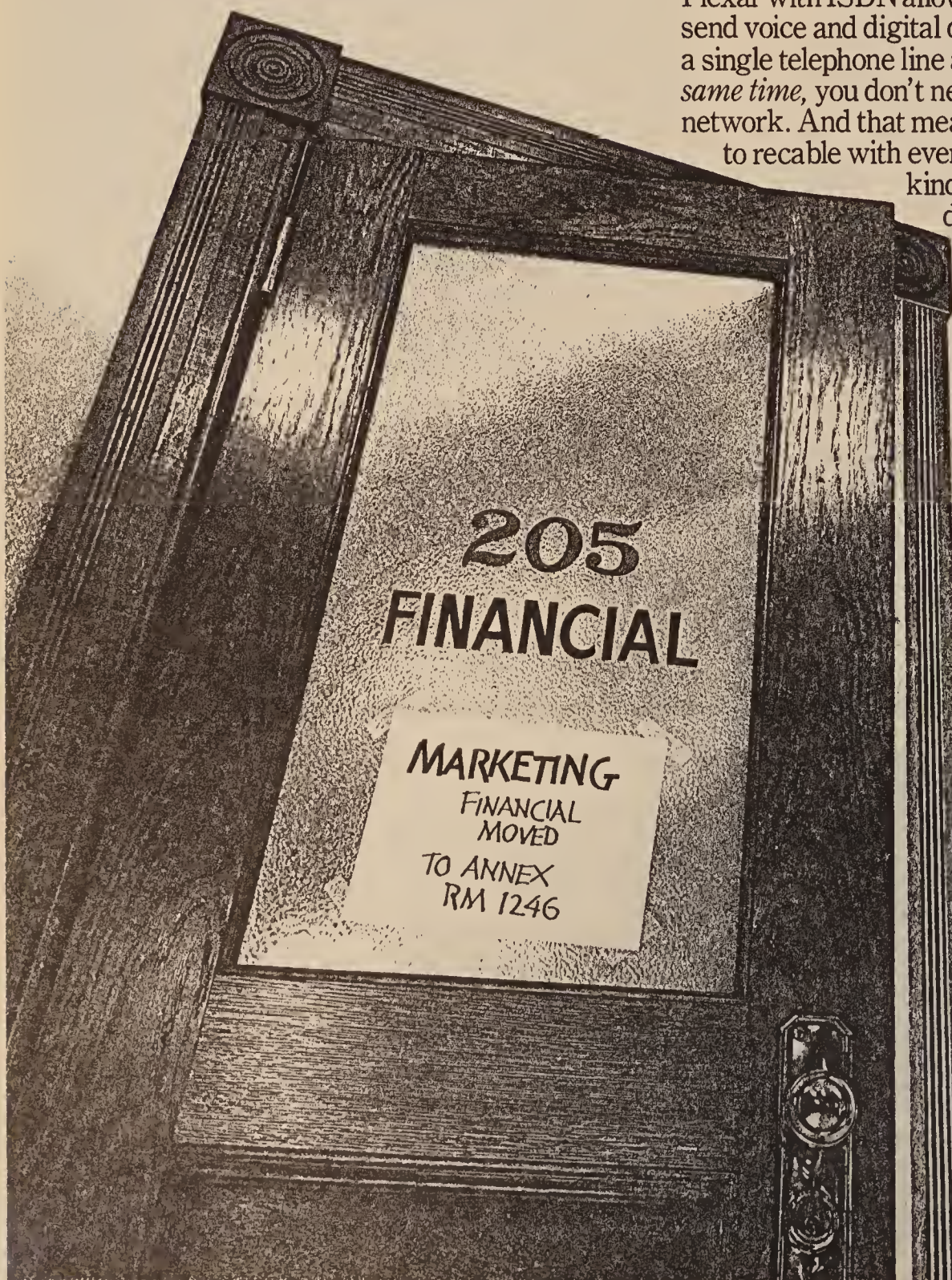
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*Special equipment and a special database required to display caller's name and identify incoming phone number, respectively.

Plexar with ISDN is available subject to regulatory approval.



TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Northern Telecom, Inc. recently installed its 50 millionth digital line for a telephone company. The line was installed as part of a long-term contract, signed in 1986, between the switch maker and Nippon Telephone and Telegraph, Ltd., which operates the Japanese telephone network.

Carrier Watch

Rochester Telephone Corp. recently announced guarantees for services provided by its RCI Long Distance and Rotelcom Network Systems subsidiaries. The guarantees ensure that products and services will perform satisfactorily at all times and outlines the response and benefits customers can expect if problems occur.

RCI, a long-distance carrier that provides a range of services, guarantees the quality of long-distance calls and will absorb the cost of the call if the customer is not satisfied.

Rotelcom, which sells and services a full line of telecommunications systems including switches from Rolm Co. and Northern Telecom, Inc., guarantees that for customers with a Rotelcom warranty or maintenance contract, it will respond to critical outages in two hours. If it is late, Rotelcom will extend the maintenance contract by a week or provide a one-week credit for the location affected. The company also promises to meet appointment dates for routine service — such as moves, adds and changes — or provide the work for free, and it will have customer service staff available to provide status reports on repairs.

RCI and Rotelcom have sales offices in Albany, Binghamton, Buffalo, Elmsford and New York, N.Y., as well as in Boston, Cranford, N.J., Philadelphia and Scranton, Pa. ☐

MCI to give banking group long-haul service discounts

Aggregate traffic plan will save up to 25%.

By Anita Taff
Washington Bureau Chief

DENVER — MCI Communications Corp.'s Western Division recently announced an exclusive two-year agreement with the Washington State Bankers Association that will give member banks service discounts based on the aggregate traffic volume of all participants.

The agreement covers switched- and private-line voice and data services and will yield savings of up to 25% for users, according to Robert Anderson, executive vice-president of the Washington State Bankers Association.

Anderson estimates that 90% of Washington's 115 commercial banks will join the program.

Earlier this month, AT&T announced a similar arrangement with the American Bankers Association which, in addition to discounts on long-distance service, includes bulk purchase savings on telecommunications equipment and office products.

AT&T and US Sprint Commu-

nications Co. also have offerings that allow state governments and universities to aggregate their traffic on virtual network services to receive volume discounts.

Although the agreement with MCI does not include equipment, Anderson said the contract could be expanded to include products. "We don't want to throw the whole kitchen sink at our bankers to begin with," he said.

"We've found that [because] banks don't deal with telecommunications as their primary business, they really don't care all that much [about equipment]. All they want is the proper toll connection, appropriate billing and a good service for a reasonable price."

Besides the discounts, Anderson said one of the biggest selling points of the agreement is control.

By participating in the purchasing program, the banks collectively have much greater influence over and access to the carrier than any of them would have alone, he said. ☐

WASHINGTON UPDATE

BY ANITA TAFF

FCC gives nod to AT&T's enhanced services.

The Federal Communications Commission last week gave AT&T permission to begin offering three types of enhanced services — voice messaging, information services and transaction services — through its regulated telephone operations. The new services will be offered as part of a larger arrangement referred to by AT&T as the Enhanced Services Complex (ESC). ESC will serve as a vehicle for AT&T to offer enhanced voice and data services through equipment collocated at AT&T central offices.

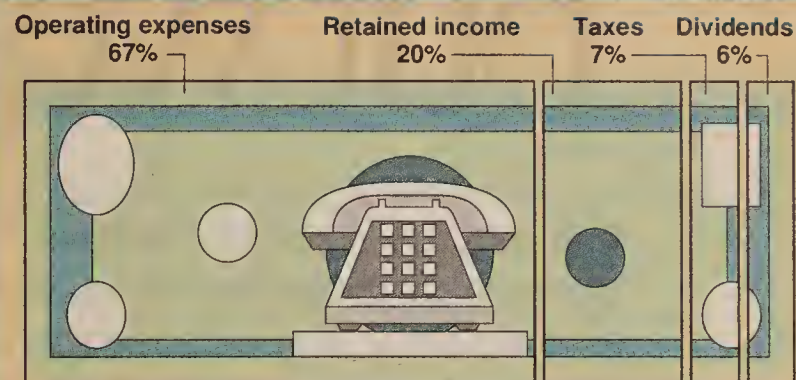
AT&T gave only general descriptions of the services and how they would be used but told the FCC a number of users are already interested in the services.

The voice-messaging service will enable users to record, send and retrieve messages using equipment within AT&T's network. Information services will allow users to retrieve voice-programmed customer information stored at the ESC central office. And transaction services will enable users to perform transactions by getting the ESC to retrieve and update information from remote data bases.

Because the service is to be offered through its regulated telephone unit, AT&T had to develop and receive approval for a Comparably Efficient Interconnection (CEI) plan. The plan outlines how AT&T will provide competitors with equal access, quality and rates for the network services it uses in enhanced operations.

Several parties, including the Committee of Corporate Telecommunications Users and the Independent Data Communications Manufacturers Association, protested AT&T's ESC proposal. Two of the chief complaints were that AT&T's descriptions of the service were so vague that it could offer practically anything under the guise of ESC and that it had not sufficiently met all CEI requirements to show it wouldn't discriminate against competitors. ☐

Where local telco dollars go



Figures show how each dollar paid to USTA local telephone companies is spent. The USTA represents 1,371 local telephone companies.

SOURCE: UNITED STATES TELEPHONE ASSOCIATION, WASHINGTON, D.C.
GRAPHIC BY SUSAN J. CHAMPENY

US Sprint upgrade boosts call capacity

DMS Supernodes will let carrier better manage peak traffic loads, increase call handling by 45%.

By Bob Wallace
Senior Editor

KANSAS CITY, Mo. — US Sprint Communications Co. recently completed a networkwide upgrade of 41 Northern Telecom, Inc. DMS-250 central office switches to DMS Supernodes, a move that boosts call processing capacity by 45%.

US Sprint said the upgrade enables it to handle greater call volumes and better manage peak traffic loads on its all-fiber nationwide network.

The carrier embarked on the \$40 million project in October 1987 primarily because increased call volumes were quickly chewing up the call-handling capacity of a switch here and others in Atlanta, Houston and Fort Worth, Texas.

Pushing the limits

"Because of traffic growth, we were pushing the limits of switches in several locations," said Terry Yake, vice-president of network engineering for US Sprint. "DMS Supernode got us out of an architectural limitation of the DMS-250."

Introduced in July 1987, DMS Supernode increases the power and functionality of Northern Telecom's DMS series of central office switches.

DMS Supernode includes DMS-Core, DMS-Bus and DMS-Link. DMS-Core is the brains and the power of DMS Supernode and handles computing and control functions. DMS-Bus is a high-speed transaction switch, which acts as the hub that joins all system component ports and enables them to communicate.

DMS-Link is the software that allows telephone companies to network DMS Supernodes and

provide services to customers across different central offices.

US Sprint's upgrade required the replacement of the DMS-250's proprietary 16-bit processor, the NT40, with the DMS Supernode's 32-bit Motorola Corp. 68020-based processor. "It was a brain transplant with no service outage," Yake said.

Replacing the processor would have only increased the number of busy-hour call attempts the DMS-250 can handle by 35%. The carrier bought itself another 10% by using the NT40 as an enhanced I/O controller (EIOC), a device that supervises I/O channels.

These channels carry billing and traffic data. Off-loading this function to the second processor enables the central office switch to handle more calls, Yake said.

US Sprint upgraded the first DMS-250 in March 1988 and the last switch just last month.

"The immediate benefits of Supernode are that we can handle more volume of the same kind of traffic and can handle surges in traffic much more gracefully than we have in past," Yake said.

Before deciding to standardize on Supernode when its network switches approached full capacity, US Sprint simply installed sister switches to pick up the load. "We put Kansas City on the top of the upgrade list just so we wouldn't have to buy and install a second DMS-250," Yake said.

Besides obviating the need to install new switches, upgrading to Supernodes may help the carrier roll out new services faster. "We can load more new features and services into the switch software without the fear of exceeding the capacity of those switches," Yake said. ☐

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

“IBM’s [Systems Application Architecture] is probably in the same state today as SNA was in the early 1970s. The architecture is there, but the implementation of that architecture is relatively sparse.”

Gary Weis
Senior vice-president
Sears Technology
Services, Inc.
Chicago

Data Packets

Timeplex, Inc. last week announced a software upgrade that enables its Timepac NP100E and NP500 packet switches to route traffic between IBM cluster controllers and front-end processors that support Qualified Logical Link Control (QLLC), IBM’s X.25 implementation.

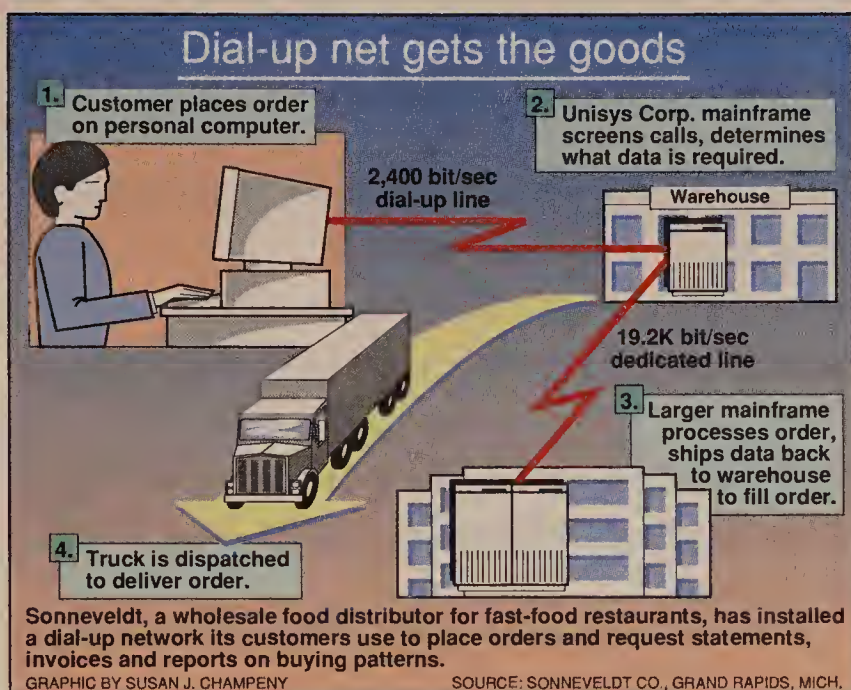
By converting incoming Synchronous Data Link Control packets to QLLC, the software enables users to replace leased lines with X.25 packet-switched facilities.

The new software also enables the switches to support the CCITT X.121 Addressing and Call Translation standard.

X.121 will enable a private network of Timeplex switches to route traffic between multiple public packet nets and to automatically reroute packets destined for a failed host.

The software upgrade is available now at no charge.

Digital Communications Associates, Inc. (DCA) last week said it has licensed Digital Equipment Corp.’s Local Area Transport (LAT) protocol, which DEC uses to link its minicomputers to terminal servers. DCA will offer LAT as an option on its network products in place of X.25 or Transmission Control Protocol/Internet Protocol software, saving users the trouble and expense of implementing those protocols. □



Wholesaler uses dial-up net to improve operations

Network offers customers enhanced services.

By Paul Desmond
Senior Writer

GRAND RAPIDS, Mich. — In an effort to speed deliveries to customers and cut costs, a wholesale supply company here is installing a dial-up network that its customers can use to place orders and retrieve account data.

Sonneveldt Co. is a \$100 million-per-year wholesaler of food and other supplies with about 700 customers, most of which are fast food restaurants.

The company has traditionally taken orders over the telephone but decided to install the dial-up order-entry net to reduce the cost of supporting its growing customer base and to serve as a foundation for new services, said Leonard Stevens, director of information systems.

To anchor the network, the company bought two Unisys Corp. mainframes — an A1 and A12, Stevens said.

Customers place orders by using one of their own personal computers running terminal emulation and communications software from Intercomputer Communications Corp. of Cincinnati to dial into the A1 mainframe.

The A1, located in a Sonneveldt warehouse here, acts as both a front-end to and a hot backup for the larger A12 mainframe located at the company’s data center in its headquarters three blocks away.

The A1 answers personal computer calls placed at 2,400 bit/sec over dial-up lines, determines what data the customer needs and retrieves it from the A12 via a 19.2 bit/sec link, Stevens said.

Sonneveldt-developed software running on the customer’s microcomputer extracts data from each screen display field and sends only that data over the

dial-up link instead of the entire screen format, he said. That greatly reduces the amount of data that has to be sent for each transaction. “We’re effectively operating as if we were doing 9.6K,” Stevens said.

After placing an order, customers find out immediately when products will arrive because the mainframe order-entry program is tied to another program that updates distribution schedules with each order. That helps the company deliver most orders the next day, even those received as late as 6 p.m., Stevens said.

Previously, Sonneveldt had to wait until the entire day’s orders were in before determining distribution routes. Besides placing orders, customers can check price lists, request the most recent statement for their account, ask for usage reports to examine buying patterns or retrieve a duplicate invoice and have it written to the personal computer’s hard disk. All transactions are handled in real time.

Although the company only has six customers on-line so far, the dial-up net promises a large reduction in telephone bills plus savings in labor since fewer operators will be required to take customer orders. The dial-up net, like the previous voice system, will rely on toll-free 800 lines, Stevens said.

“Because of the time it takes to verbally transmit an order vs. the time it takes a computer to transmit an order, we’re looking at a 10-to-1 cost reduction on phone bills,” he said. “We’re probably looking at \$2,000 to \$3,000 a month right there, maybe more.” Stevens said it is too early to predict how much the company will save by reducing labor costs. □

Sides divide on new junk fax legislation

Outlawing unsolicited faxes would protect users, but opponents say definition of ‘junk’ is unclear.

By Paul Desmond
Senior Writer

As facsimile machines grow in importance to business, many states have proposed legislation to curb the fax transmission of unsolicited advertisements, so called “junk faxes.”

What started as a convenient way for fax product suppliers to advertise threatens to burgeon into a problem that will cost fax users money and bog down their fax machines, according to advocates of junk fax legislation.

But opponents claim the problem has been blown out of proportion and the legislation threatens to punish legitimate fax users in addition to purveyors of junk faxes.

According to BIS CAP International, Inc., a consultancy in Norwell, Mass., nearly half of all states are considering or have already considered legislation aimed at curtailing junk faxes.

On the federal level, Rep. Ed Markey (D-Mass.), chairman of

the U.S. House of Representatives’ Subcommittee on Telecommunications and Finance, recently filed a bill that would authorize the Federal Communications Commission to compile a list of telephone numbers to which advertisers would be forbidden to send junk faxes.

According to Jerry Stern, vice-president of research at The Eastern Management Group, a consulting company in Parsippany, N.J., there are a number of issues behind the move to curb junk faxes. The recipient has to pay for the paper and chemicals required to print the fax, and junk faxes tie up the recipient’s fax machine.

In addition, there is a privacy issue involved, Stern said. Advertisers are “basically taking advantage of somebody else’s facilities to force an advertising message down their throat.”

But Stern said the problem has been exaggerated, a position held by junk fax legislation opponents. (continued on page 18)

Arm of Agriculture Dept. links up with local nets

By Jim Brown
Senior Editor

WASHINGTON, D.C. — The U.S. Department of Agriculture’s National Agricultural Statistics Service (NASS) recently contracted to have its 45 offices outfitted with local networks that will eventually be linked via an X.25 backbone.

Under terms of the eight-year, \$16.2 million contract, Sysorex Information Systems, Inc., a systems integrator in Mountain View, Calif., will install and maintain Ethernet local nets running Novell, Inc.’s NetWare in each NASS office and a total of 800 to 2,000 Intel Corp. 80286- or 80386-based microcomputers.

The nets will replace a mix of equipment in the offices and position NASS to connect to the Federal Telecommunications System (FTS) 2000 network, a private voice and data network being installed for federal agencies.

NASS offices currently have IBM 3270 terminals; stand-alone microcomputers emulating 3270 terminals; and minicomputers that support data entry terminals and emulate IBM 3770 remote job entry (RJE) terminals.

“We’ve got a combination of just about everything in the field offices,” said Robert Griffith, chief of NASS’ user services branch. “One of our goals was to standardize the equipment in the field offices so that everybody is using the same thing.”

The data route

NASS estimates crop and livestock production and pricing for each state by talking to farmers. Each office has an average of 15 to 20 people. The offices upload the crop and livestock data to a Martin Marietta Data Systems mainframe in Orlando, Fla., via dial-up or leased lines that operate at up to 9.6K bit/sec and support IBM’s Systems Network Architecture protocols.

Martin Marietta Data Systems processes the information and prepares reports for NASS staff in Washington, D.C. These reports are made available to the public, including commodities and futures traders. Users in each NASS office can also access mainframe applications and data so they can perform administrative functions pertaining to each office.

(continued on page 18)

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Agriculture arm links up with local nets

continued from page 15

To provide access to the mainframe, each local net will support three communications gateways. Two gateways will enable local net-attached microcomputers to emulate 3270 terminals or 3770 RJE workstations and access the host via existing dial-up or leased lines. The other gateway will link the local nets to an X.25 network that is part of FTS 2000.

NASS expects to be linked to FTS 2000 by late next year. Until then, the agency will continue to use its existing transmission facilities.

The General Services Administration "has told us that FTS 2000 is mandatory for us," said Phil Zellers, director of NASS' technology division. "But we're really

looking forward to it."

FTS 2000's X.25 network, Zellers said, will help NASS standardize communications among offices. Because each local net will support electronic mail capabilities, FTS 2000 may also eliminate the need to use public E-mail services. NASS currently uses Dialcom, Inc.'s E-mail services.

FTS 2000's X.25 network may also help NASS support the disparate systems used by state governments, which rely on NASS for agricultural statistics, according to George Howse, deputy state statistician in NASS' Minnesota office.

The microcomputers, local nets and communications gateways will be installed over a two-year period, starting with NASS

headquarters in Washington, D.C. later this month and the Lincoln, Neb., field office in November. After that, NASS will outfit five offices with local nets once every three months.

The agency will preserve existing microcomputers only if they are IBM Personal Computer ATs or compatibles; otherwise, it will replace the devices with products from GCH Systems, Inc., a small firm in Mountain View, Calif., that makes IBM Personal Computer compatibles.

Local nets were chosen over minicomputers for a number of reasons, Zellers said. Local nets can more easily support a wider number of users than minicomputers, they have a wider range of communications options, and they can be reconfigured to support new technologies much faster than minicomputers. ■

Sides divide on new junk fax legislation

continued from page 15

nents. The fear is of the unknown: What will be interpreted as junk faxes?

"You don't know what these laws do until after they're passed," said Bill McCue, who, until recently, was president of Public FAX, Inc. in Orange, Calif., a company that markets fax-related services.

McCue said each state has to specify what constitutes a junk fax; otherwise, a faxed letter following up a sales call or a press release sent to a newspaper, for example, could be construed as unlawful.

"If you just say, 'You cannot send an unsolicited fax advertisement,' you have to define what is solicitation and what is an advertisement. That becomes a bag of worms," McCue said.

So far, only three states — Connecticut, Maryland and Oregon — have passed legislation that forbids or curtails junk faxes.

Proponents of junk fax legislation said McCue's argument is unrealistic and that junk fax laws would be self-enforcing.

"If somebody gets something they don't want, they can bring an action," said Steve Heminger, administrative assistant

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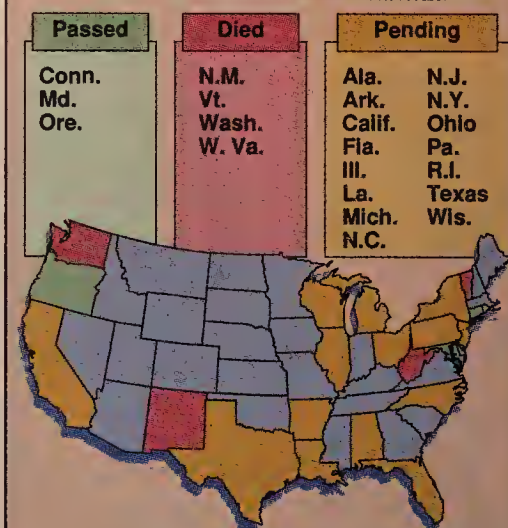
For a copy of the complete contest rules, or a list of winners, send a self-addressed stamped envelope to Communication Networks '90, P.O. Box 9171, Framingham, MA 01701.



Taking Networking into the 90's

Washington, D.C. • February 5-8, 1990

Status of anti-junk fax legislation



SOURCE: BIS CAP INTERNATIONAL, INC., NORWELL, MASS.
GRAPHIC BY SUSAN J. CHAMPNEY

to state Sen. Quentin Kopp of California, a supporter of junk fax legislation. "If somebody gets something they want, even if they didn't request it, they're not going to haul you off to the district attorney."

Most users contacted by *Network World* do not think the junk fax issue is serious enough to warrant legislation.

"I prefer not to see it because then you're going to get different rules in different states," said Ian Michel, president of Applied Telematics, Inc. in Wayne, Pa.

As the number of fax machines continues to grow, Michel said, it will reduce the chances of a junk fax coming to any one machine.

That is the opposite of what many sponsors of junk fax legislation believe.

"It is not a major abuse problem yet, although it does occur, [but] it will be one that grows over the years unless something is done about it," said Connecticut state Rep. Richard Tulisano, who filed a bill prohibiting junk fax that will become law in that state on Oct. 1.

Other users said the junk fax issue may be a sign that it is time to take fax machines more seriously. "Today, fax is kind of an unmanaged entity, at least within our company," said Bernie Schneider, director of telecommunications at United Stationers Supply Co. in Des Plaines, Ill. "I expect that sometime somebody's really going to have to take responsibility." ■

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LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

“The percentage of token-ring shipments for PC LANs is expected to increase from 34% of the overall PC LAN market in 1988 to 48% in 1992. The percentage of Ethernet shipments, meanwhile, will decrease from 40% to 35% over the same period.”

Brad Baldwin
Senior analyst for local nets
Dataquest, Inc.
San Jose, Calif.

Netnotes

Netronix last week announced an Ethernet bridge, the EtherMaster 13000 Bridge, that supports throughput of up to 14,000 packet/sec and has advanced security and administration capabilities.

The bridge operates at the media access layer and supports an AUI computer-to-network bus interface as well as a ThinNet interface. The bridge is compatible with networks from Novell, Inc., Digital Equipment Corp. and other Ethernet-compatible wares.

Although the bridge can support 14,000 packet/sec throughput, when the Spanning Tree Protocol is used, the device forwards 12,500 64K-byte packet/sec and supports 25,000 packet/sec filtering.

The product is available now for \$3,400. An introductory price of \$2,900 applies to orders taken before Nov. 15.

Action Technologies, Inc. is sponsoring a conference Oct. 5 through 6 in San Francisco for third-party developers that use the company's Message Handling System (MHS) for internetwork electronic mail and other messaging applications. The Message Handling Technology Conference will cover such topics as the future of MHS, application program interfaces to MHS and building messaging into data base applications. ■

Test shows SQL Server is viable alternative for OLTP

Benchmark puts microcomputers on OLTP map.

By Susan Breidenbach
West Coast Bureau Chief

REDMOND, Wash. — Microsoft Corp. and Ashton-Tate Corp. last week released benchmark results showing their jointly marketed OS/2 SQL Server product for microcomputers is a viable alternative to larger on-line transaction processing (OLTP) systems.

In tests conducted last May and June, Microsoft used the TP1 benchmark to rate the SQL Server. That benchmark is a de facto industry standard for measuring OLTP performance. The tests were run on Microsoft's 7,000-node corporate network during regular business hours.

SQL Server attained a peak of 10.54 TP1 transactions per second on a 33-MHz Compaq Computer Corp. Deskpro 386 with four simultaneous users who were generating a continuous

stream of transactions. The Deskpro 386/33, which is capable of executing five million instructions per second, was equipped with 10M bytes of memory and an internal 630M-byte hard disk drive with an 18-msec average access time.

When the number of concurrent users was increased to 40, performance only degraded to 7.8 transactions per second. Microsoft said the cost of SQL Server in terms of price per transaction was \$3,490, many times lower than that of minicomputer- and mainframe-based OLTP systems.

The tests were audited by two data base experts, Colin White of Colin J. White Consulting in Morgan Hill, Calif., and Richard Finkelstein of Performance Computing, Inc. in Chicago. Both men said the results were impressive.

(continued on page 20)

Oracle unveils financial, SQLnet packs for HP 3000

By Sarah Vandershaf
West Coast Correspondent

BELMONT, Calif. — Oracle Corp. recently announced versions of its SQLnet networking software and financial packages for Hewlett-Packard Co.'s HP 3000 line of minicomputers.

SQLnet allows Oracle's SQL relational data base management system to be distributed across a network, allowing a group of computers to run portions of the DBMS and access other portions across the network.

The software also supports client/server applications, allowing applications to access information on other processors. SQLnet software resides on the computer running the application and on the computer where the data is stored.

SQLnet for the HP 3000 will utilize HP's AdvanceNet network architecture to allow HP 3000 minicomputers to support distributed data bases and client/server applications, said Sean Bandarkar, senior product manager for Oracle's minicomputer division. IBM Personal Computers and compatibles, Apple Computer, Inc. Macintosh computers and Unix-based workstations can also run on the network, he said.

Other versions of SQLnet are available for such systems as Digital Equipment Corp. VAXes, Sun Microsystems, Inc. workstations

and the HP 9000 minicomputer, which runs Unix and is used primarily in engineering applications, Bandarkar said.

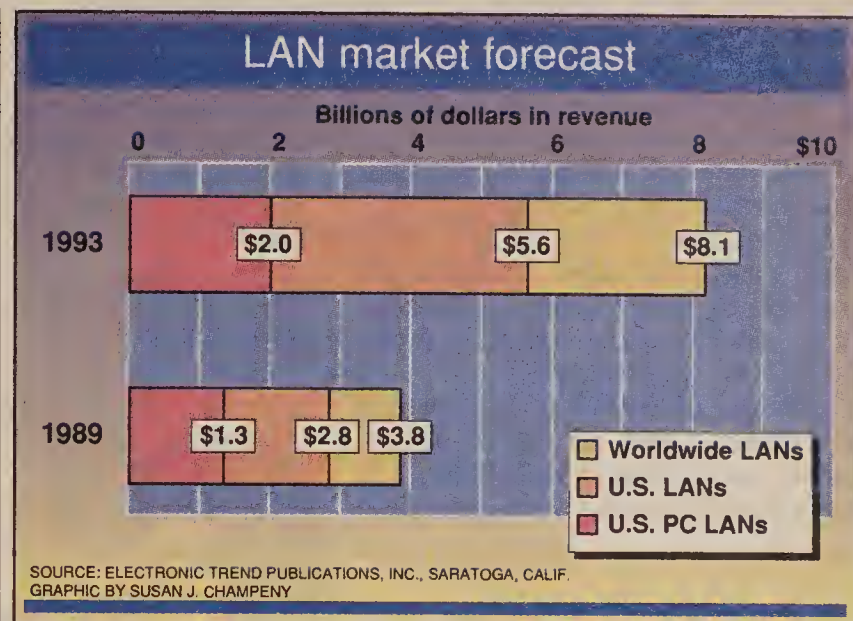
Financial packages bow

In addition to the introduction of SQLnet for the HP 3000, the company said it will release an HP 3000 version of its Oracle Financials, a suite of integrated financial applications that run on top of the Oracle relational DBMS.

The Oracle Financials line includes General Ledger, Payables, Purchasing and Assets packages for maintaining an inventory of company equipment, such as computers, cars or desks. Other packages are Inventory, Receivables and Revenue Accounting.

The financial software will also be available for Data General Corp. computers, said Laura Olson, a spokeswoman for Oracle's applications division. The applications are already available for VAXes, Sun workstations, HP 9000s and other systems, she said.

The software packages will be available in October. SQLnet for the HP 3000 ranges in price from \$10,000 to \$40,000; the price of the Oracle Financials software depends on the platform. Pricing for the HP 3000 version starts at \$32,200, and pricing for the DG version begins at \$24,150. ■



NetWare 386 tops bill at NetWorld '89

Roughly 20,000 users flock to LAN show, get a glance at wares from more than 300 exhibitors.

By Susan Breidenbach
West Coast Bureau Chief

DALLAS — There was no sign of a slowdown in the local network market as about 20,000 people turned out at NetWorld '89 here last week to sample the wares of more than 300 exhibitors.

The star of the show was Novell, Inc.'s newly released NetWare 386 Version 3.0, which third parties are scrambling to support.

One of the first to market was Gateway Communications, Inc. of Irvine, Calif. The company announced the availability of drivers that enable its local- and wide-area Ethernet link products to operate under NetWare 386, Novell's network operating system for servers based on the Intel Corp. 80386 microprocessor.

The Gateway products include G/Ethernet network interface boards and remote bridges, as well as its Systems Network Architecture, X.25 and asynchronous gateways. Gateway also announced an OEM version of NetWare 386.

Novell and Da Vinci Systems Corp. of Raleigh, N.C., introduced DDENet, which will enable NetWare 386 environments to support the Dynamic Data Exchange (DDE) facility in Microsoft Corp.'s Microsoft Windows and OS/2 Presentation Manager. DDE lets Microsoft Windows or Presentation Manager applications exchange information dynamically, but it currently requires the applications to reside within a single workstation.

DDENet will let a user on one workstation establish sessions with DDE-aware applications on other workstations, displaying each in a separate window and linking them as needed for the

purpose of dynamic data exchange. This will enable nonprogrammers to create simple distributed applications by combining several off-the-shelf Microsoft Windows or Presentation Manager products.

The DDENet software includes client and server components. The latter is being implemented as a NetWare Loadable Module, a facility for adding server-based applications to NetWare 386 3.1 and above.

Despite all the interest in NetWare 386, most of the product introductions were targeted at the installed base of NetWare 2.1X users.

Despite interest in NetWare 386, most of the introductions were for NetWare 2.1X users.

▲▲▲

CocoNet, Inc. of Coral Gables, Fla., got a jump on the various companies reselling Portable NetWare by releasing a product that gives a DOS workstation simultaneous access to a NetWare 2.15 server and an 80386-based system running The Santa Cruz Operation, Inc.'s Unix/Xenix 386. CocoNet 1.3 lets the workstation run both a NetWare shell and Microsoft's MS-Net redirector at the same time.

The new product gives NetWare users transparent access to the Unix file system and print-spooling facilities, and it delivers NetWare file and print services to

(continued on page 20)

NetWare 386 tops bill at NetWorld '89

continued from page 19

Unix/Xenix users. CocoNet 1.3 costs \$2,595; the price includes the server software and an Ethernet interface for one Unix/Xenix V 386 system, plus unlimited DOS workstation software.

One product generating a lot of enthusiasm from attendees was Microtest, Inc.'s port subsystem for connecting printers, plotters and other shared devices directly to a network. LANPort, contained in a case the size of a small book, has one or two serial ports or a parallel port.

Each configuration is available in models with AUI or BNC network connectors; pricing ranges from \$495 to \$695. LANPort is compatible with LAN Systems, Inc.'s

LANSpool print-spooling utility for NetWare networks. It can also be used with J&L Information Systems, Inc.'s NCSLAN software to attach a shared modem or plotter to the network.

Another modem-sharing product released at NetWorld was a new version of Cross Information Co.'s LAN+Modem. Enhancements in Release 2.3 include Digital Equipment Corp.'s VT-100, VT-52 and ANSI terminal emulation and a DOS Interrupt 14 interface that lets other communications packages work with the product. The product now also supports NetWare's Internetwork Packet Exchange (IPX) transport protocol, which saves NetWare users the extra time and memory overhead associated with loading Network Basic I/O System.

There were a host of massive storage

subsystem announcements at NetWorld. Among them, New York-based Advanced Graphic Applications, Inc. (AGA) became the first company to receive Novell compatibility certification for an erasable optical disk drive. AGA's DISCUS Rewritable subsystem, which includes a 650M-byte optical disk, a host adapter and device driver software, costs \$6,495.

CBIS, Inc. of Norcross, Ga., said its CD Connection software now supports NetWare IPX as well as NETBIOS. The software enables users to share existing CD-ROM drives across a local network. An eight-user version is priced at \$895. CD Connection can also be purchased with CBIS' CD Server, a CD-ROM subsystem that comes in a tower configuration supporting as many as 14 CD-ROM drives.

Plus Development Corp. of Milpitas,

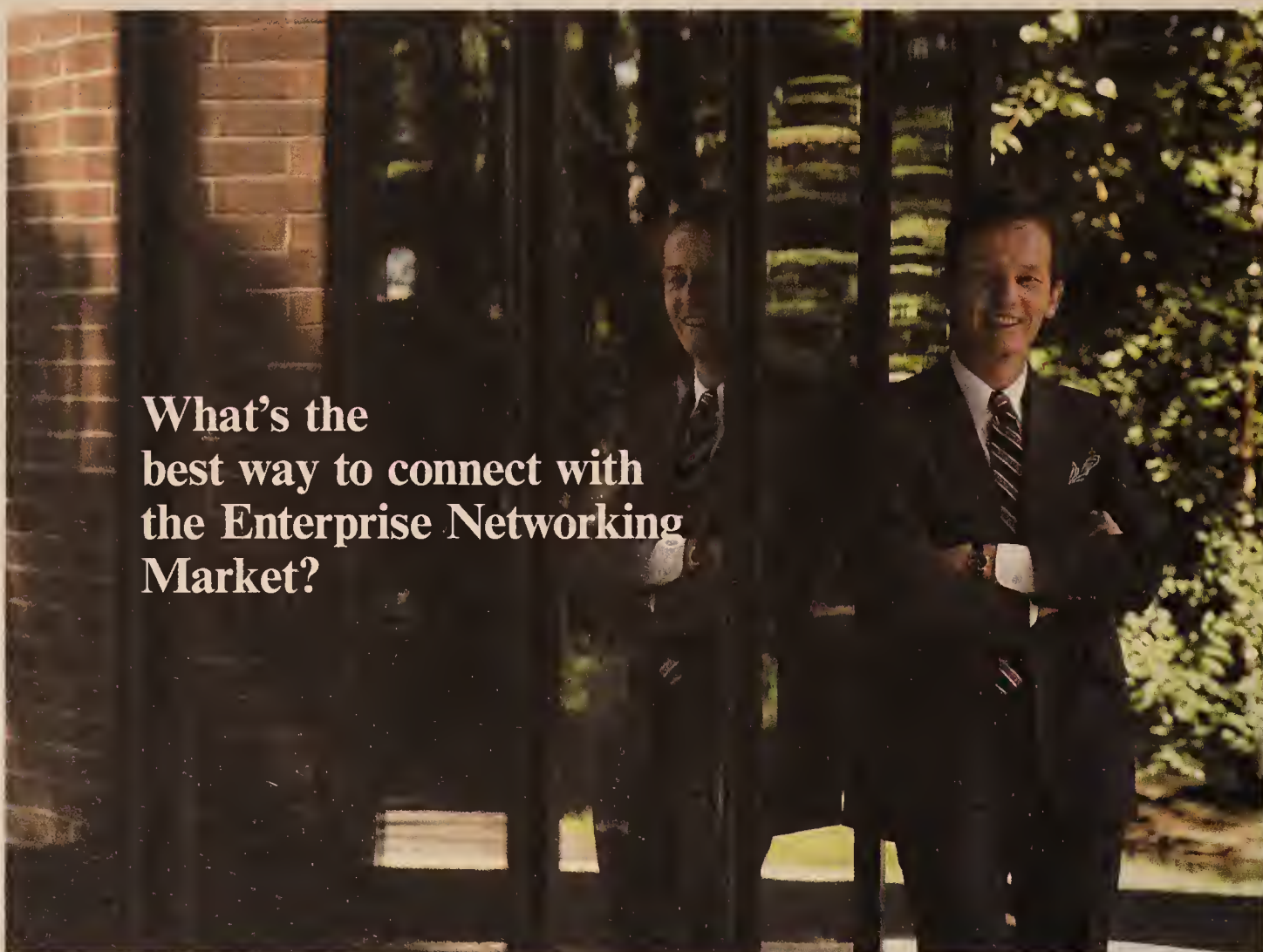
Calif., claimed a first with a new driver that enables the Cluster Disk Interface (CDI) in its new Plus Impulse MultiDrive subsystem to exploit the multiple-disk channel architecture of NetWare 286. Using multiple data channels, the CDI provides a dedicated data pathway from the file server to each of the four 80M-byte Impulse drives in the subsystem.

According to Plus, the 320M-byte MultiDrive cluster with the new Novell multiple-channel driver will provide at least twice the throughput of a 300M-byte Enhanced Small Device Interface drive in I/O-intensive conditions. The MultiDrive Cluster is priced at \$5,075.

Emerald Systems Corp. of San Diego and its cross-town rival, Gigatrend, Inc., both used NetWorld to introduce 4mm digital audio tape (DAT) backup systems for NetWare networks. The products each hold approximately 1.2G bytes of data and boast average access times of about 20 seconds.

The two DAT subsystems range in price from \$5,950 to \$8,490, depending on options. ■

Gary Beach, Publisher, *Network World*



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IDG
Answers for the Information Age.

SQL Server is viable alternative to OLTP

continued from page 19

"These results demonstrate that it is now possible to base high-performance on-line transaction processing applications on PC LANs, which we couldn't do a year ago," Finkelstein said.

"Microsoft conducted these benchmarks in a completely open manner, allowing us to audit their procedures, source code and other benchmark details," White said. "The SQL Server benchmarks are faithful to the industry-accepted definition of TP1 and were run under very realistic conditions."

The TP1 benchmark measures OLTP performance on multiuser hosts by simulating a series of banking transactions. With the help of White and Finkelstein, Microsoft adapted the test to run on DOS and OS/2 systems operating in a client/server environment.

"It's a very clean and honest benchmark that will stand up to close scrutiny," according to Finkelstein. "It will be very difficult for any other vendor to beat SQL Server on the OS/2 platform." SQL Server is an "extremely good alternative to a minicomputer."

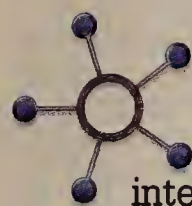
Users who are willing to pay a premium can still find minicomputer OLTP systems that will run circles around 80386-based SQL Servers. A top-of-the-line OLTP system from Tandem Corp., for example, might be able to top 80 TP1 transactions per second, White and Finkelstein said.

More than raw performance

They also pointed out that raw performance isn't the only issue to consider in deciding on an OLTP platform. "There are still differences in the reliability and robustness of the hardware between the minicomputer and microcomputer levels," Finkelstein said. "Within a year though, I think those differences will go away."

The complete "SQL Server On-Line Transaction Performance" report, as well as an SQL Server Benchmarking Kit containing technical details and benchmark source code, are available free of charge from Microsoft, which can be reached at P.O. Box 97017, Redmond, Wash. 98073; or from Ashton-Tate, located at 20101 Hamilton Ave., Torrance, Calif. 90509. ■

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*PC Week, Benchmark Testing, 7/3/89.

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IBM, Novell, Banyan NOS support	✓		✓
Bus master network interface cards		✓	✓
Integrated UTP for 4 and 16 Mbps			✓
Mixed-media MAU: UTP, STP and fiber			✓
High availability out-band network management			✓

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

MANAGEMENT PROFILE

BY BARTON CROCKETT



EDI helps automate Proviso's distribution operations.

Canadian wholesaler reaps EDI savings

MONTREAL — Companies that implement electronic data interchange should be prepared to integrate the technology into core business operations if they want their investment to pay off.

So claim officials at Proviso Distribution, Inc., a grocery store wholesaler based here that has spent \$500,000 each of the past four years implementing one of the most extensive EDI programs in North America.

Finally cashing in

Despite the fact that the company already handles roughly 80% of its purchase orders and invoices via EDI, Proviso Distribution is just now expecting its first EDI savings. The reason, according to Maurice Dignard, corporate manager of EDI, is that the company only this year began using EDI in a manner that changed the way its employees work.

"You can't go into EDI halfheartedly," Dignard said. "That's a surefire formula for failure."

Proviso Distribution has annual revenues exceeding \$4 billion and buys about \$1.2 billion worth of goods each year from some 425 suppliers. The compa-

nies had to pore over paper invoices and purchase orders in search of billing discrepancies before checks could be cut. Problems used to crop up in about 40% of Proviso Distribution's transactions, Dignard said.

The new software automates the task of ferreting out errors. It



Proviso's Maurice Dignard

compares EDI purchase orders and invoices formatted according to grocery industry EDI standards with each other and notifies accountants when there is a problem. The software runs on IBM System/38 minicomputers, which handle operations at each of the company's 13 warehouses.

Dignard said that labor savings from using the new software is the primary reason Proviso Distribution expects to save money with EDI this year.

Labor, postage and data entry savings from EDI this year for the first time are expected to exceed the company's \$500,000 annual EDI implementation and operation expenses, Dignard said.

These savings will total about \$2 per purchase, he added.

(continued on page 26)



ny distributes goods to more than 1,000 independent grocery stores in the province of Quebec.

Long-haul

What turned the EDI tide for Proviso Distribution is software the company installed this year that automates the process of checking purchase orders and invoices for errors.

In the past, company account-

American firms establish European net plans for '92

Many ask how fast trade barriers will dissolve.

By Wayne Eckerson
Staff Writer

Many U.S. companies are devising pan-European network strategies that will help them tap new markets when trade barriers among European countries are removed, starting in 1992.

But while a unified Europe offers companies a host of opportunities to expand market presence in Europe, most say it's unclear how quickly trade barriers will disappear or what shape a single European economy will take.

"We're very conscious about what's going on in Europe, and we're positioning ourselves accordingly," said Bill Rush, vice-president of information systems at Prudential Insurance Co. of America in Roseland, N.J.

"A united Europe has more economic vitality than a balkanized Europe. [The trade reforms] will make it easier to do business in Europe as well as increase competition," Rush said.

Prudential is in the midst of developing network and data processing strategies for its approximately 30 European offices. Rush said the plans are still evolving as Prudential watches and

studies developments in Europe.

Other companies are pushing ahead to complete networking projects already under way. An international networking manager at a large producer of food and beverage products said privately that his company is building a large private digital network that will interconnect its regional and divisional headquarters in Europe.

The network, which should be finished by mid-1990, will connect 14 sites in Europe to a hub in London that will be linked to the company's headquarters in the U.S. An open market "will revolutionize communications throughout Europe and make it much easier to build and run an international network," the manager said.

The pan-European picture

The advent of uniform network standards throughout Europe will make it faster and ultimately less expensive to build pan-European networks, he said. Today, the telephone authorities in each country impose different restrictions on customer pre-

(continued on page 26)

GUIDELINES

BY ERIC SCHMALL

Taking care of business when key workers leave

It happens all the time. Thirty days before a major switch cutover, the project leader resigns. Or a new front-end processor arrives, and the sole systems programmer on your staff gives his two-week notice.

In most network departments no one is qualified to replace such departed staffers. Specialization is the parent of this dilemma.

Most network departments are overrun by technology specialists. Voice experts, data gurus and hardware freaks proliferate. If any one of these specialists suddenly leaves, the resultant vacuum can force postponement of major projects.

Usually, communications managers use short-term solutions to help alleviate the emergency. One is the traditional brain-dump approach. Managers ask the departing specialist to hand over all project materials to someone else, who knows little if anything about the project in question.

This is accompanied by a series of impromptu lectures. Often the resigning specialist and the unfortunate person named to take over his duties don't even speak the same language. Try to get a systems programmer to describe the nuances of IBM's Network Control Program to a person whose only data communications experience is with modems.

A second short-term fix is to bring in a consultant. In major or strategic projects, this is often the only alternative. Unfortunately, consultants are expensive and do little to increase the expertise of a network staff.

None of these alternatives addresses the core problem of

(continued on page 26)

Dialogue

Aligning information technology with corporate business goals is a common aim today. How does your company ensure its business and technology strategies are integrated?

"We have an executive planning group that reviews the strategic plans of Baxter's 46 operating divisions. One of the members of this group has a telecommunications background, and he pays close attention to networking issues.

"The group helps the divisions modify their strategic plans based on information it gathers from throughout the company. For example, the group might recommend that we purchase more mainframe hardware to support a large application under consideration by another division.

"While this is somewhat of a top-down approach, we also have a technical steering committee that brings together the telecommunications and data processing heads in each division twice a year. The strategic planning people also attend these meetings to hear about technological developments and concerns. In this case, information tends to flow from the bottom up."

George Sparks

Manager of telecommunications planning
Baxter Healthcare Corp.
McGaw Park, Ill.

"Our information service technology group is composed of senior directors in five different technical areas: operations, information center, technical support, data base systems and application development. The group as a whole is headed by a senior manager whose role is to represent the group's interests and concerns before top management. Our senior directors meet regularly to review policy and more frequently when they need to define the specifications of a new project. Then they report the results of their discussions to the senior manager.

"This setup works much better than a steering committee, where a group of directors reviews policy and makes recommendations but has no responsibility for actually implementing a project."

Brian Cary

Director of technical support
American Bar Association
Chicago

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AT&T has the most reliable 800 service in the world.

If you're not using AT&T's basic 800 Service, you're running the risk of losing 54% more calls. The reason is no mystery. The AT&T Network has far greater switching capacity, three times the alternate routing capability and the highest percentage of call completions of any long distance carrier. This allows AT&T to provide the most reliable 800 service in the world.

The fact is, we have more ways to get 800 calls through than any other network. AT&T has 40 signal transfer points compared to six each for Sprint and MCI. And while Sprint and MCI have only three network control points apiece, AT&T has 94.

When it comes to performance, no one comes close to AT&T's basic 800 Service. We connect calls faster than anyone else. On average, our nearest competitor's call set-up time is 50% slower. And we have the fewest blocked calls of any 800 service. AT&T's network routing system (Dynamic Non-Hierarchical Routing) is so sophisticated, it makes 21 different routes available for every single 800 call. MCI and Sprint can't offer that advantage. Which explains why they have 30% more blocked calls than we do.

So really, the only unexplained phenomenon here is why you'd risk having your valuable 800 calls disappear when they could be traveling the safest route.

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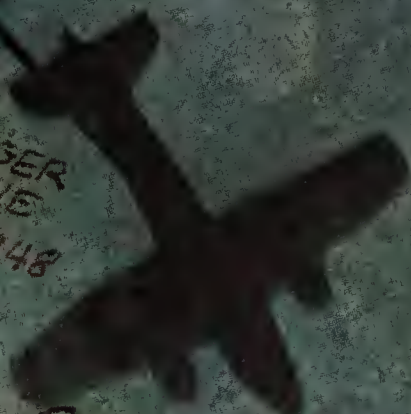
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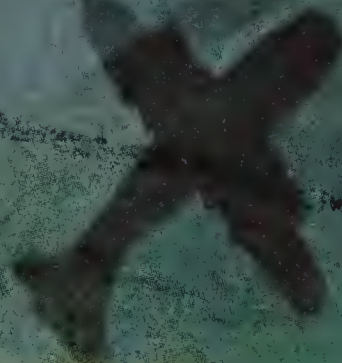
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AT&T

The right choice.

Canadian wholesaler reaps EDI savings

continued from page 23

In Provigo Distribution's EDI network, System/38 minicomputers at the company's warehouses exchange EDI messages via dedicated links — usually at speeds of 9.6K bit/sec — with the company's corporate mainframe here.

The mainframe, in turn, sends and receives EDI messages to and from suppliers via third-party networks operated by such vendors as GE Information Services and Telecom Canada.

Getting to the point where his company could reap savings required first getting most of its suppliers to use EDI, Dignard said. About \$820 million worth of Provigo Distribution's annual purchases are han-

dled with electronic purchase orders and invoices today.

Provigo plans to extend use of EDI by requiring all of its suppliers to handle all invoices and purchase orders electronically by December 1990. Suppliers who do not comply will be dropped, Dignard said.

Top management backing

"We couldn't do this without tremendous management backing from the chairman of the board on down to the president," Dignard said. To implement such an extensive EDI program, Provigo has not only had to reprogram its internal computer systems to handle EDI, but the company has had to dedicate vital staff resources to persuading suppliers to sign up.

This responsibility has fallen largely on the shoulders of Dignard, who said he

spends about 60% of his work week on the road, mostly convincing suppliers to sign up for EDI.

Dignard said Provigo Distribution hopes to expand use of EDI to include electronic notification of price changes and new products, improving the accuracy of its purchasing data bases.

Notifications will be loaded via the company's EDI network directly into data bases used by buyers at Provigo Distribution warehouses. This, in turn, will give buyers more up-to-date information about prices and terms offered by suppliers and should cut the number of purchase order errors, thereby reducing accounting costs.

"The No. 1 mistake some companies make with EDI is only doing a little bit at a time," Dignard said. "You need to implement it broadly, or it won't pay off." ■

Americans establish European net plans

continued from page 23

ises equipment, among other things.

New CCITT standards for fractional E-1 (the European equivalent of T-1), 64K bit/sec digital service and videoconferencing will also facilitate the building of networks spanning different European countries. Competition among countries offering standard services will drive down prices, making it less expensive to run circuits between countries, the manager said.

Federal Express International Transmission Corp. (ITC) sees 1992 as an opportunity to expand aggressively in Europe. The company provides transmission services for its parent company, Federal Express Corp., as well as third-party network services to outside customers.

The subsidiary is planning to expand its X.25 packet-switching network into three additional European countries by 1992. The company currently provides packet-switched services in England and Belgium.

"We plan to connect our packet-switched network with existing packet-switched networks to create a vast communications infrastructure within Europe," said Guy Knight, who manages sales and marketing for Federal Express ITC in Memphis, Tenn.

The new regulatory environment might encourage other companies to relocate their European hubs to be closer to their operating units, said Robert Alex, president of RTA & Associates, Ltd., an international telecommunications consulting firm in Farmington Hills, Mich.

Most companies have situated their hubs in the U.K. because the country's deregulated environment has reduced costs there. But that might change as the regulatory environment in other countries eases, Alex said.

While the regulatory environment will change after 1992, it will happen more slowly than most users think, said Alan Burgess, managing partner of the telecommunications industry group for Andersen Consulting in Atlanta.

European countries differ greatly in the quality of network service they can provide and the extent to which they are deregulated. As a result, the development of a unified communications environment in Europe will happen slowly and unevenly, Burgess said. "It will be quite some time before Europe has an intelligent, unified communications network," he said. ■

Major developments in PBX technology will be exposed on September 26 at the TCA Show in San Diego.

See for yourself at Booth 706.

NEC

PRODUCTS & SERVICES

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Worth Noting

See inside for:

- NEC's new I-Series management system that supports networkwide diagnostics.
- Digital Link DSU/CSUs designed for T-1, fractional T-1 and European T-1 lines.

First Look

ProNet-10 adapter performance tripled

Proteon, Inc. recently introduced a microcomputer interface card for its ProNet-10 10M bit/sec token-ring network that offers a threefold performance increase over the company's earlier ProNet-10 adapters. The **p1308 Network Interface** supports unshielded twisted-pair wiring through an integrated filter, compared to earlier adapters that used an external filter.

The p1308 Network Interface, which can be used with IBM Personal Computer XTs, ATs and compatibles, gains its performance increase through 16-bit I/O. Earlier Proteon cards had eight-bit I/O. The p1308 shifts the checksum process — analyzing packets of information for errors — from software to hardware, which can perform the task more efficiently. The device drivers have also been enhanced to provide higher performance.

The p1308 supports Novell, Inc.'s NetWare Version 2.15, Banyan Systems, Inc.'s VINES and FTP Software, Inc.'s PC/TCP. It will support NetWare 386 in the fall.

The p1308 Network Interface costs \$595 and will be available in mid-November.

Proteon, Inc., 2 Technology Drive, Westborough, Mass. 01581; (508) 898-2800.

Pack automatically executes programs

Digital Products, Inc. recently announced software that automatically executes
(continued on page 29)

Cisco routers support X.25 switching

By Tom Smith
New Products Editor

MENLO PARK, Calif. — Cisco Systems, Inc. last week enhanced its line of network routers to support X.25 switching, claiming its routers are the first capable of operating simultaneously as X.25 packet switches and multiprotocol routers.

Combining those functions will help users integrate existing X.25 devices into wide-area networks supporting the Transmission Control Protocol/Internet Protocol and will eliminate redundant transmission facilities.

Routers are used to connect two or more networks and forward data packets among them accordingly. Most routers, which operate at the network layer of

the Open Systems Interconnection model, support multiple protocols.

Although Cisco already offered X.25 protocol support on its family of routers, it only enabled users to interface data communications equipment to X.25 packet-switched networks, according to Edward Kozel, marketing program manager at Cisco.

The new software, X.25 Switch, adds switching capabilities so users can create their own X.25 packet-switching networks by linking multiple routers.

The Cisco routers that will support X.25 Switch are the CGS, MGS and AGS, which have two, three and five communications interface slots, respectively.

Each router supports 14 communications protocols, with the user choosing software for the appropriate protocols. The software is included in the price of the router.

The company offers two interface boards for the routers, one with two Ethernet and two serial
(continued on page 28)

Gateway lets IBM hosts fax to Group III machines

STILLWATER, Okla. — Teubner & Associates, Inc. recently unveiled a personal computer-based gateway that enables IBM mainframes to send facsimiles to Group III fax machines.

Called FaxGate, it consists of two communications boards for an IBM Personal Computer, Personal System/2 or compatible, as well as multifunction software.

The software makes the microcomputer look like an IBM 3770 remote job entry terminal to IBM mainframes. It can be attached to a host through a coaxial cable link to a 3X74 controller or an IBM Token-Ring Network, or it can be linked to a front-end processor via Synchronous Data Link Control or a Token-Ring.

IBM 3770s look like remote printers to mainframes, according to Russ Teubner, president of Teubner & Associates. "This lets an application use FaxGate with absolutely no modification," Teubner said. "Any application that can print can fax."

Without 3770 emulation, the product would have required a software component on the mainframe. Teubner & Associates' approach, by contrast, is to keep the IBM host's role as passive as possible.

How it works

To initiate a fax, users specify "FaxGate" as the destination. The mainframe spooler then routes the information to FaxGate, where it can be transmitted

immediately or stored on hard disk for transmission when phone rates are lower. A single fax can be broadcast to as many as 100 recipients, Teubner said.

Customers can use a FaxGate phone book stored in the personal computer's memory to send faxes to frequently called people by simply selecting a form containing the telephone number and other pertinent transmission information. The phone book can store as many as 2,000 forms.

According to Teubner, the product can also be used to reduce remote-site costs by eliminating leased communications lines and dedicated printers. "We are encouraging people to view the installed base of fax machines as printers that they can access over the dial-up telephone network," he said.

FaxGate's output quality is better than that of conventional fax machines because there are no paper documents to scan, according to the company. FaxGate automatically requeues transmissions if busy signals or other errors occur. Available now, it can support four outbound lines.

Together, the two communications cards and software cost \$4,895. The company also offers the product along with an Intel Corp. 80286-based personal computer, which costs \$6,895.

Teubner & Associates can be reached in writing at P.O. Box 1994, Stillwater, Okla. 74076, or by calling (405) 624-2254. □

Bridge sustains 10M Ethernet throughput

CrossComm's ILAN uses dual processors, high filtering and transfer rates for peak performance.

By Tom Smith
New Products Editor

MARLBOROUGH, Mass. — CrossComm Corp. recently introduced an Ethernet-to-Ethernet bridge designed to maintain full 10M bit/sec throughput under maximum traffic loads.

The High Speed Bridge Ethernet-to-Ethernet (HSB-EE) is part of the company's ILAN line of multinet bridges, which can be configured to support Ethernet, token-ring and T-1 interfaces.

The bridge is protocol-independent, supporting Transmission Control Protocol/Internet Protocol, Digital Equipment Corp.'s DECnet, Xerox Corp.'s Xerox Network Systems, Open Systems Interconnection and other protocols.

HSB-EE, a local bridge that supports thick or thin Ethernet cabling, offers significantly better performance than the company's ILAN bridge model configured as an Ethernet-to-Ethernet device.

In an Ethernet-to-Ethernet configuration, the ILAN bridge supports only 14,000 packet/sec filtering and 6,000 packet/sec throughput.

HSB-EE, by contrast, filters 30,000 packet/sec and transfers 15,000 packet/sec. A single Ethernet can generate a maximum of 15,000 packet/sec so even under heavy loads, the bridge will not block packets.

The bridge has a dual-processor architecture that enables it to maintain maximum throughput. One processor, a 16-MHz Intel Corp. 80386, performs network management, while the other processor is programmed exclusively to receive packets and route them to their destination.

Most bridges have a single CPU that searches an address table for a packet's destination, according to Tad Witkowitz, president of CrossComm. As more nodes are added, data traffic increases, the address table grows longer and it takes longer for the bridge to find a packet's destination.

Dedicating a processor in the HSB-EE to routing traffic eliminates the bottleneck and enables it to maintain 10M bit/sec throughput.

This technique enables the self-learning HSB-EE bridge to handle as many as 40,000 node addresses. HSB-EE also supports the Spanning Tree Protocol, which calculates the capacity of

each transmission path, selects one as primary and places the one with the lowest capacity in backup mode. This provides for fault-tolerant bridging of networks.

HSB-EE is fully compatible with CrossComm's ILAN multi-network bridges, enabling customers to use HSB-EE bridges to connect local networks that are also bridged to remote nets via wide-area links. Buying both types of products from a sole vendor has inherent advantages, Witkowitz said.

"If customers buy a local bridge from one vendor and a wide-area net bridge from another, they may end up with two dif-

HSB-EE filters 30,000 packet/sec and transfers 15,000 packet/sec.

▲▲▲

ferent network management schemes and interoperability problems," Witkowitz said. "If data has to go across a local bridge and then across a wide-area net bridge to reach its destination and it doesn't get there, who does the customer call?"

Because HSB-EE is also compatible with CrossComm's ILAN Management Software (IMS), an enterprisewide network can be united under one management system. IMS offers security features such as filtering by protocol and address so certain nodes or local nets can be restricted from receiving data. It also provides statistics such as packets received, packets transmitted and packets transferred.

IMS requires two pieces of software: one that is resident in every bridge and another that resides on an Ethernet server or workstation linked to HSB-EE. IMS costs \$2,950.

HSB-EE can also be used in a simple campus environment to link Ethernet segments and pass data between the two networks on an as-needed basis. It supports thick-to-thick, thin-to-thin and thick-to-thin cabling connections.

HSB-EE is the result of a joint
(continued on page 29)

NEC I-Series management system enables networkwide diagnostics

By Tom Smith
New Products Editor

SAN JOSE, Calif. — NEC America, Inc. recently introduced a management system for its I-Series line of modems and data service unit/channel service units (DSU/CSU) that support status monitoring, control and diagnostics.

NEC's I-Series product line includes a central-site chassis that can accommodate modems and DSUs/CSUs. The new I-Series E management system includes the I1001E controllers and I1002E subcontroller boards that fit in the chassis.

Subcontrollers can manage a 16-slot chassis, or up to 32 devices, using dual-modem cards, which were included in the I-Series product announcement. Up to 15 subcontrollers can be managed from a master controller.

The master controller, which has an eight-line, 21-character LCD display, takes four card slots, leaving 12 of the 16 chassis slots available for communications devices. With subcontrollers in 15 chassis managing 32 devices and a chassis with a master controller, the system can support a maximum of 504 devices.

The I-Series E enables users to monitor and configure any of the modems or DSUs/CSUs in the I-Series system from both local and remote sites. Continuous monitoring of a subcontroller can take

place from a Digital Equipment Corp. VT-100 or compatible terminal. Although the controller comes equipped with the front-panel display, users can access the same information from a VT-100.

The entire system is monitored simultaneously, but only information for a single chassis can appear on the screen at a given time. Continuous monitoring information includes data about whether a device is idle or in use, the speed of transmission and whether error correction is being used.

Users can access information about specific equipment by designating the de-

vice by its system address. An EIA-232 monitoring capability lets users determine whether the device is on or off and whether proper data communications signaling is taking place.

A feature the company calls soft configuration locking maximizes the benefits of modem-sharing applications, according to Alan Zoraster, product manager at NEC. The feature enables a modem to be custom-configured by the communications software controlling the session. After the configuration, the modem returns to a default setting.

The company also announced two new I-Series modems — the I9632 and the I2432E. The I9632 is a dual-modem card that operates at up to 19.2K bit/sec synchronously or asynchronously over two-wire dial-up lines. The modem supports

Microcom, Inc.'s Microcom Network Protocol (MNP) Class 2 to 4 error control as well as Class 5 data compression, which allows it to operate at 19.2K bit/sec.

The V.22 bis I2432E supports either synchronous or asynchronous transmission in dial-up or leased-line environments. It operates at 2,400 bit/sec and supports MNP Classes 2 through 5.

The I-Series E controller and subcontroller and the I2432E are available now. The I9632 will be available in December.

The I1001E controller costs \$795, while the I1002E subcontroller is priced at \$395. The I2432E costs \$1,095, and the I9632 costs \$2,695.

NEC's Data and Video Communications Systems Division can be reached in writing at 110 Rio Robles, San Jose, Calif. 95134, or by calling (408) 433-1250. ■

Cisco routers support X.25 switching

continued from page 27

connections, and the other with four serial connections. The serial connections can support T-1 trunks.

T-1 support will differentiate cisco's routers from other companies' routers and from X.25 products in general, Kozel said, because the majority of X.25 products support a maximum link speed of 64K bit/sec. He claimed that no other X.25 equipment works at T-1 speeds or offers both X.25 and multiprotocol support simultaneously.

Another advantage of the cisco devices is that multiple routers can be interconnected using the industry-standard TCP/IP rather than requiring proprietary protocols. This enables packet networks to use TCP/IP's dynamic rerouting based on packet delay, traffic flow, error rates and security concerns.

SNMP-compatible

X.25 Switch encapsulates the X.25 data in TCP/IP format transparently to the user. A user can also manage both X.25 and TCP/IP equipment from a single network management system. The routers' software complies with the Simple Network Management Protocol (SNMP), so any SNMP-compatible systems can manage the devices.

X.25 Switch software will be provided free with cisco's existing X.25 software, which costs \$1,200. Customers with a one-year warranty on the routers can receive the switch upgrade free of charge; those no longer under warranty will be charged a \$100 fee. The product is scheduled to be available in October.

Cisco can be reached in writing at 1350 Willow Road, Menlo Park, Calif. 94025, or by calling (415) 326-1941. ■



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First Look

continued from page 27

communications programs on personal computers attached to Digital Products asynchronous networks.

ModemManager works with Digital Products' PrintDirector and NetCommander asynchronous networks, which support printer sharing, low-speed file sharing and automatic tape backup among personal computers.

Using a pop-up menu, ModemManager users can view a directory of available modems on the network and a user-definable library of up to 16 telephone numbers. Users can select the first available modem or a modem they have dedicated to support a specific application.

ModemManager automatically pre-

pare the communications commands, adjusts transmission rates, selects communications ports and executes the communications package.

ModemManager works with many communications software packages, including Digital Communications Associates, Inc. CrossTalk XVI Version 3.6.1, VM Personal Computing, Inc.'s Relay Gold, Hayes Microcomputer Products, Inc.'s SmartCommII and Coefficient Systems Corp.'s VTERM.

ModemManager requires a Hayes-compatible modem.

The software is priced at \$150 for each PrintDirector or NetCommander network. All future releases of PrintDirector and NetCommander networks will support ModemManager. Current network users need special read-only memory versions of the

network to use ModemManager.

Digital Products, Inc., 108 Water St., Watertown, Mass. 02172; (617) 924-1680.

Digital Link DSU/CSUs suited for T-1, fractional T-1, European T-1

Digital Link Corp. has released new-generation data service unit/channel service units (DSU/CSU) designed for use with T-1, fractional T-1 and European T-1 lines.

The products convert nonformatted data from high-speed data devices for transmission over T-1 and European Conference Europeenne des Postes et Telecommunications lines. Each product contains a built-in CSU so it can be used for both public and private T-1 lines. The con-

verters are compact and modularly designed for desktop stacking or rack mounting.

The **DL551VX** has two V.35/RS-449 ports on the data terminal side and can connect to either T-1 or fractional T-1 lines on the network side. It supports D4 or extended superframe format (ESF) framing and complies with either the AT&T PUB 54016 or ANSI T1E1 standards for Facility Data Link (FDL).

The DL551VX can display line performance data on the front-panel display through an attached terminal or via a Network Management port that will be available from Digital Link later this year.

The DL551VX is priced at \$2,995. Delivery takes 60 days after receipt of order.

The DL551V II has a single V.36/RS-449 port and can be used with D4 channel banks or ESF T-1 facilities. It is an enhanced version of Digital Link's DL551V DSU/CSU and sells for \$2,295. Delivery takes 30 days, according to the company.

The DL2048V connects a single V.35, RS-449 or X.21 data terminal equipment port to an HDB3 encoded G.703 public or private network.

For G.704 network applications, G.704 multiframing can be used.

The DL2048V is priced at \$2,295 and is available 30 days after receipt of order.

All three products are said to be compatible with local network bridge, router and gateway products by Vitalink Communications Corp., cisco Systems, Inc., Proteon, Inc. and 3Com Corp.; channel extender products by IBM and Computer Network Technology Corp.; and computer-aided design and manufacturing workstations such as the IBM 5088.

Digital Link Corp., 133 Caspian Court, Sunnyvale, Calif. 94089; (408) 745-6200.

Electronic POS interface controller for IBM 4683/4 debuts

Symbol Technologies, Inc. has introduced an electronic point-of-sale interface controller for IBM 4683/4 series electronic POS systems. The **SymbolLink 332 (LL332)**, which fits in a 4683/4 terminal, supports a range of Symbol scanners, digital wands and magnetic strip readers. It also supports RS-232-C output device such as scales or portable terminals.

The LL332 is designed for retail applications and is available now.

Symbol Technologies, Inc., 118 Wilbur Place, Bohemia, N.Y. 11718; (816) 563-2400. ■

Bridge sustains 10M Ethernet throughput

continued from page 27

development agreement signed in 1988 between CrossComm and TRW, Inc.'s Information Networks Division. Both TRW and CrossComm will market the bridge independently to their customers.

Witkovic said the product offers a price and performance advantage over Digital Equipment Corp.'s Ethernet-to-Ethernet bridge, the DECLAN Bridge 100.

According to DEC, a local version of that product is priced at \$6,500. Its filtering rate is 24,272 packet/sec and its forwarding rate is 13,404 packet/sec.

HSB-EE costs \$3,850. It is scheduled to ship the first week of October.

CrossComm can be reached in writing at P.O. Box 699, Marlborough, Mass. 01752, or by calling (508) 481-4060. ■

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OPINIONS

OPEN SYSTEMS INTERCONNECTION

BY JOHN MCQUILLAN

An old solution for new challenges?

The conventional wisdom is that Open Systems Interconnection will be the only game in town for multivendor interoperability. Indeed, almost all of the suppliers in the industry have been working toward the goal of a uniform set of protocols that can be certified to interoperate correctly.

This movement away from proprietary protocols is one of the great turning points in the communications business. It represents a grand mutual nonaggression pact among network providers.

Certainly, OSI is the right solution for a broad range of compatibility problems. But will it be equally appropriate to meet the challenges of the next 15 years? Will OSI be a faithful servant of our network requirements into the next century?

As we move into the '90s, we may expect a paradigm shift away from many of the data communications traffic patterns of the past. OSI was developed to support file transfer. But in the future, with extremely high-speed local networks and workstations, the more likely requirement will be for file access. Workstations rely on distributed data bases and distributed file, name and print servers, which can operate by more intelligent sharing of data than today's simple transfer of an entire file.

Likewise, OSI was developed to support electronic mail and message traffic. As the rapid growth in the popularity of facsimile illustrates, many organizations have found that achieving compatibility at the data level isn't worth the price. In the future, electronic record communications is likely to continue to diversify into multimedia applications with image, data, graphics and voice all playing a role.

As a third example, consider the OSI support for terminal traffic. The Virtual Terminal Protocol enables terminals to communicate with host computer systems for which such interaction was never originally intended — a major step forward. But we are now entering an era of very powerful workstations with complete operating systems and human interfaces.

Cooperative processing between diverse, previously incompatible workstations is now necessary. The virtual terminal concept is fine as far as it goes, but it will need to be extended to support more powerful user interfaces, graphical support systems and operating system capabilities. Today's workstations are capable of supporting remote procedure calls and distributed file systems that extend across local and wide-area networks. We need good protocols to support these tools.

As one final and extremely important observation, consider this: The OSI protocol concepts were developed in an era of multikilobit-per-second networking. We are already entering an era of multimegabit-per-second networking with local networks and T-1 technology. Soon, with Fiber Distributed Data Interface and T-3, the stakes will be higher. By the time OSI is mature, we will be on the brink of multigigabit-per-second networking.

By then, the elaborate many-leveled protocol stack that we have all come to know and love will be extremely inefficient. The 20-byte, variable-length network address will be cumbersome and ill-suited to high-speed bridges and routers. A simple hierarchical address will be more appropriate for network processors that must handle hundreds of thousands of packets per second. Streamlined protocols will be necessary to provide cost-effective support of workstation-to-workstation data flows at tens of megabytes per second, especially for noncoded information.

OSI has done a good job of remedying many of the problems that have plagued us in the '70s and '80s. I wonder if it will serve as well in meeting the challenges that lie ahead in the '90s. **Z**

McQuillan is president of McQuillan Consulting in Cambridge, Mass. He assists users and vendors in planning future communications systems.

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EDITORIAL

Misplaced privacy concerns shouldn't hold back CNI

Of all the new telecommunications services that will become available as the plain old analog telephone network is transformed into an Integrated Services Digital Network, calling number identification (CNI) is easily the most controversial.

CNI, which enables telephone subscribers to know who is calling them before they pick up the phone, will be the basis upon which sophisticated call-screening applications will be built.

Ultimately, users may be able to buy computerized telephones with built-in data bases that will selectively accept, reject or forward calls, depending on who is calling.

But members of a vocal minority, led by those who currently have unlisted telephone numbers, are insisting on the right to conceal their identities when they make phone calls. They are demanding that the phone companies make it possible for subscribers to suppress CNI and prevent their phone numbers from being revealed.

It should be kept in mind, however, that only a small percentage of telephone subscribers have unlisted numbers. They should not be allowed to have undue influence on public policy relating to CNI-based services to the detriment of the majority of telephone users.

A useful way to examine CNI-related privacy issues is to draw an analogy with a home owner answering the door of a resi-

dence. You have the right to know who's knocking before you open your door, so why shouldn't you have the right to know who's calling before you answer your phone?

The ability to suppress CNI should not be offered at all unless the majority of telephone subscribers also have the capability to reject calls from people who are suppressing CNI. And even then, CNI suppression

cluded in the CNI information.

The debate over CNI privacy issues promises to be long and shrill. Already, corporations and telephone companies experimenting with CNI have found that it will take time for people to accept it as normal. In CNI trials by Bell Atlantic Corp. and American Express Co., for example, some users were disconcerted when addressed by name immediately after completing a call.

Nevertheless, trials conducted to date indicate that CNI is one of the most popular of the new public network services that will become available over the next few years as ISDN and Common Channel Signaling System 7 are implemented by all local and long-distance carriers.

One of CNI's principal benefits is that it will enable people to put an end to harassing phone calls simply by entering those particular calling numbers into their call-rejection data bases.

Once CNI is widely available, people will get used to the idea that their numbers go out into the network when they make calls — in fact, that's already the case. For billing purposes, the phone companies have long had the capability to know who's calling. CNI simply extends that capability into the local loop on the other end.

CNI is an important new public telecommunications service. It will be a pity if misplaced privacy concerns delay its availability. **Z**

CNI will enable people to put an end to harassing phone calls by entering those calling numbers into their call-rejection data bases.

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should be priced high enough to deter people from using it indiscriminately.

In the future, if the intelligent public network develops as predicted, people's telephone numbers will travel with them in microprocessor-based calling cards so that their CNI information will go out no matter where they're calling from. Then when people call from telephones other than their own, both their actual number and the number they are calling from will be in-

OPINIONS

REGULATORY ISSUES

BY ALAN PEARCE

The RBHCs still face roadblocks to MFJ relief

The 101st U.S. Congress is tightening its grip on the policy-making process that affects the telecommunications information industry.

Bills have been introduced concerning the entry of the regional Bell holding companies into equipment manufacturing and information services, high-definition television policies and standards, price caps for local telephone companies, telephone company and cable TV cross-ownership, public telephone regulation and standards, spectrum allocation and auctions, telephone company capital cost recovery, Rural Electrification Administration telephone loan programs and a plethora of mass media issues.

Congress also made it clear that it will closely scrutinize and even control the Federal Communications Commission during recently held confirmation hearings for the three Bush nominees — Chairman Alfred Sikes and Commissioners Andrew Barrett and Sherrie Marshall.

The major policy issue currently before Congress, however, concerns the line-of-business restrictions imposed on the RBHCs in the Modified Final Judgment. Now, apparently, the RBHCs are gaining some ground on Capitol Hill, but many roadblocks still exist to the passage of a bill that would give them some much-needed business relief — if not necessarily regulatory relief.

The good news for the RBHCs is that senior Capitol Hill staffers began drafting a so-called jurisdictional bill during the summer recess and into the fall for possible introduction this winter. Two leading and influential members of the House of Representatives will sponsor it — Rep. John Dingell (D-Mich.), Chairman of the House Energy and Commerce Committee, and Rep. Ed Markey (D-Mass.), Chairman of the House Telecommunications and Finance Subcommittee.

The jurisdictional bill would merely transfer the oversight of the Modified Final Judgment from U.S. District Court Judge

Harold Greene to the FCC. Then the FCC would be expected to launch rulemaking proceedings with a view to allowing the RBHCs into equipment manufacturing and information services, subject, of course, to FCC rules and regulations.

Senior Capitol Hill staff members are encouraging the various interested parties to get together so that a consensus can be built around a bill that would then move quickly through the House. So far, AT&T and the cable TV companies have refused to participate in these consen-

Congress made it clear that it will closely scrutinize and even control the FCC.

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sus-building meetings. However, the cable TV companies, which are in big trouble on Capitol Hill because of price gouging that has been occurring since they won deregulation from Congress under a 1984 bill, may be forced into participation. Nonetheless, the cable industry may prefer reregulation to an FCC rulemaking that would permit telephone companies to enter the cable TV business.

Other people presenting roadblocks for the telephone companies include Rep. Jack Brooks (D-Texas) — chairman of the House Judiciary Committee and a supporter of the Modified Final Judgment and Greene in recent hearings before his committee — and the Senate leadership, which has so far refused to take up the issue of RBHC business relief.

Another problem is the recent strike by the Communications Workers of America (CWA) against some of the RBHCs. The CWA has always been a favorite of Dingell, who strongly supports blue-collar unions. If the CWA opposes legislation freeing the RBHCs, then Dingell's support for the legislation might evaporate.

A final difficulty surrounds the meaning of the word "jurisdictional." Under the Communications Act of 1934, "jurisdiction"

refers to the shared regulatory responsibility of the FCC and the state public utility commissions. The bill that is being drafted, however, simply transfers the Modified Final Judgment from Greene to the FCC.

This transfer sounds simple enough, but as the bill moves through the House and the Senate, those wishing to sabotage it may broaden the legislative debate to include new ideas of what the FCC should regulate and what the states should regulate.

One idea that was floated several years ago is that the FCC should regulate all traffic between local access and transport areas, whether it be interstate or intrastate, leaving the states with the more limited responsibility over intra-LATA services. The states would oppose this idea, even though it makes some sense in a postdivestiture era.

Indeed, Greene has authority over inter-LATA services, so under the LATA concept, the RBHCs are limited to offering basic services within LATAs. Under the Communications Act, the states have authority over intrastate services, while the FCC handles interstate and international services.

Although prospects for Modified Final Judgment relief for the RBHCs are improving, it is unlikely that a bill will pass this year or next, largely because of opposition from Brooks, leading members of the Senate, AT&T, the cable TV industry and other interested parties. All of these parties must get behind a bill — jurisdictional or otherwise — if the RBHCs are to stand any chance of prevailing on Capitol Hill.

For the time being, however, the Senate is playing a wait-and-see game, which may end quickly if Sen. Ernest Hollings (D-S.C.), chairman of the Senate Commerce Committee, is pleased with the three new members of the FCC. If the fourth Bush nominee to the commission is Hollings' former chief counsel, Mary Jo Manning, then his confidence in the FCC will soar and his views on giving the FCC more power over the business destiny of the telecommunications and information industry could change.

At that point, a jurisdictional bill could move through the Senate very quickly. ■

Pearce is president of Information Age Economics, a telecommunications research firm in Washington, D.C.

TELETOONS

BY FRANK AND TROISE



Let's see.. the red ribbon is for wounds received during the user uprising... the gold ribbon is for bravery under fire in the budget meetings.. and the green ribbon is pesto fettucine from lunch.

LETTERS

Speedy delivery

I was pleased to read your article of Aug. 14 called "Trucks, trains and telecom." Nevertheless, we were disappointed that although mention was made of us, the report conveyed misleading impressions about our service.

To set the record straight, Pegasus Message Corp., at the end of 1988, completed commissioning our ground-based system to provide coverage of the eastern half of the U.S. About 100 vehicles have been testing the service since early this year; more than 400,000 messages have been delivered to date. On average, messages are being delivered in five to

10 minutes.

We believe that our combination of system performance and low cost provides the most cost-effective solution for everyday trucking applications. For example, last month our messaging and tracking service was instrumental in the recovery of a stolen tractor.

(continued on page 54)

Network World welcomes letters from its readers.

Letters should be typed, double-spaced and sent to Editor, Network World, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701.

Letters may be edited for space and clarity.

INTRIGUED BY ISDN? OUTSPOKEN ON OSI? Speculative about cellular phones? Don't keep your thoughts to yourself; let 'em all hang out in a guest column for *Network World's* Opinions pages.

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INDUSTRY FOCUS

MANUFACTURING

Making the 'new' factory

By MARVIN CHARTOFF and MICHAEL CORDOVANO

Our quality of life and standard of living are directly dependent on the efficiency with which we manufacture and deliver real goods. Similarly, it is the manufacturing and delivery of information that determines the success of today's manufacturing organizations.

As a result, networks — the highways for information flow — have become a critical component of the infrastructure that supports factory automation and leads to productivity improvements. Whether manufacturing operations are spread across several acres or multiple time zones, a manufacturer must be able to generate and integrate information across distributed computer systems through network connectivity.

Why factory automation?

Labor and capital were the competitive tools of the past. Today and in the future, information is going to be the key to remaining competitive in a global economy.

The manufacturing systems — networks and computers — that support factory automation fall into three broad categories:

■ **Engineering automation.** Includes hardware and software such as interactive computer-aided design graphics and computer-aided engineering (CAE) simulation systems that speed up the product definition and industrial engineering process.

■ **Manufacturing (or factory floor) automation.** Comprises capabilities such as computerized numerical controls, programmable controls, robots and drive

Manufacturing
companies
today need a
blueprint to help
them automate
their factory
information
management.

(continued on page 34)

Chartoff is a senior manager in Ernst & Young's Fairfax, Va., office. Cordovano is a senior manager in Ernst & Young's Philadelphia office.

ILLUSTRATION ©1989 STUART SIEGAL

(continued from page 33)
systems that facilitate the production of finished products from raw materials and subsystems.

■ **Information management.** Tools that control the operations of a factory and provide a means for integrating data from both the engineering and manufacturing environments.

The difficulty of applying these concepts to their specific environment and the feeling of being overwhelmed by rapidly changing technology has kept many firms from moving forward with automating factory information management. By understanding the computer, application and network technologies associated with manufacturing, organizations can develop a strategy for implementing information management.

Manufacturing hierarchy

The typical systems supporting information management can be grouped into a five-level hierarchy representing the scope of impact within a manufacturing organization. This is illustrated in the figure on this page.

For a manufacturing organization to implement information management successfully, the data bases and applications operating at each level of the hierarchy must be accessible from other

Manufacturing is a diverse industry, with segments including automobiles, aerospace, chemical processing, defense, electronics, food, heavy machinery, paper, pharmaceutical supplies and steel. While there are some common functions across all manufacturers, certain information management requirements are unique to a segment. For example, pharmaceutical manufacturers have to collect large volumes of information on product testing to satisfy Food and Drug Administration reporting requirements.

Common applications

The information management applications common to most manufacturers are similar to other industries, requiring file transfers, remote access to files, on-line transaction processing and electronic messaging. These applications support three major parts of factory automation:

■ **Computer-integrated manufacturing.** Applications consist of distributed data bases and data base management systems that schedule production, track the performance of the factory and facilitate decision making by providing integrated data on all aspects of the manufacturing organization.

■ **Just-in-time production.** Applications manage and opti-

The Big Three automobile manufacturers are making it mandatory that their suppliers support EDI to do business with them. EDI is used for business documents such as orders, shipment notification and delivery information.

Because of the distributed data base nature of the applications supporting information management, local networks are a major component of the network infrastructure of a manufacturing organization. Islands of subnetworks, dedicated to key applications, must be interconnected.

Multivendor interoperability could lead to standard network architectures such as the Open Systems Interconnection-based Manufacturing Automation Protocol/Technical and Office Protocol suite of protocols; Systems Network Architecture for IBM-dominated environments; or, because of Digital Equipment Corp.'s heavy penetration into the manufacturing industry, DECnet. The specific network architecture for an organization depends on the mix of computer systems and expected information flows.

A typical manufacturing organization comprises many networks in many locations. The corporate headquarters consists of a campus of administrative offices, a production facility and an engineering research building. Other remote plants and warehouses are located in the U.S. or overseas. Customers, suppliers and distributors may be located worldwide.

Interfacing with a customer or supplier requires support of EDI communications standards. Today, EDI standards are very specific to individual industries. For example, the grocery industry uses the Uniform Communications Standard (UCS) for EDI communications between grocery manufacturers, retail stores and distributors. While ANSI and other organizations are attempting to standardize across industries, manufacturing organizations are likely to initially use industry-specific standards.

munications that don't warrant converting to electronic form, but the vast majority of information flows within a manufacturing environment can be automated. As a result, the networks in place must have the connectivity flexibility, capacity and robustness to

■ Understand and document the current manufacturing flow procedures, processes, information systems and networks. This existing base will serve as the starting point for achieving an optimized environment.
■ Develop an ideal manufactur-

Manufacturing systems that support information management

Level	System	Computer platform
5 - Corporate	Accounting management	Mainframe
	Personnel management	Mainframe
	Materials management	Mainframe, workstations
	Engineering	Departmental minicomputer
	Marketing Warehouse/distribution	Departmental PCs
4 - Plant	Sales	Departmental PCs
	Manufacturing resource planning	Mainframe or minicomputer
	Inventory control	Minicomputer
	Shop floor control	Minicomputer or PC
3 - Area	Production scheduling	Minicomputer or PC
	Automated data collection	Minicomputer or PC
2 - Department	Material handling	Minicomputer or PC
	Computer-aided process planning	Minicomputer or PC
1 - Process	Device control	Minicomputer
	Direct numerical control	Minicomputer or PC
	Robots	Proprietary
	Machine control	Proprietary
	Flexible machine center	Proprietary
	Statistical process control	Minicomputer or PC

GRAPHIC BY SUSAN SLATER

SOURCE: ERNST & YOUNG, FAIRFAX, VA.

Interfacing with a customer or supplier requires support of EDI standards.

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levels. One large data base could be created for the entire organization; however, the availability of less expensive microcomputers and minicomputers make the concept of distributed data bases a more likely alternative. Much of the potential gain from information management lies in the integration of data bases and the minimization of manual, paper-based intervention between functions and processes.

To enable the free flow and exchange of information between systems from different vendors, the network architecture interconnecting these systems must be flexible, based on standard interfaces and easily migrated to new technologies.

The existing installed base of computers often is not compatible with networking protocols that permit universal access to information. In those cases, an organization must determine whether the competitive advantages to be achieved by integrating information outweigh the investment in new data processing equipment and application software that will be required. In most situations, the investment can be spread over time through phased migrations.

mize the flow of components through the production process and thereby reduce waste through inventory reductions.

■ **Total quality control.** Applications track costs to identify opportunities to eliminate repetition or duplication of effort, and increase production yields.

These common applications, which are very interdepartmental in nature, drive the need for a network infrastructure that allows the free flow of information.

For example, a major steel product manufacturer has linked its warehouse inventory systems so that if one location does not have a needed part, the system will identify the closest location carrying that part. This has allowed the manufacturer to be more responsive to customer requests.

In addition to applications that support internal activities, a manufacturing organization must also interact and exchange information with its customers, suppliers and distributors. Electronic data interchange applications must allow a manufacturer to easily communicate electronically with external organizations, replacing paper- and voice-based information exchange.

The question to ask is not whether information management automation should be adopted, but how, where and when.

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One of the underlying goals of information management automation is to become paper-independent. This does not imply that paper will never be used; but rather that the data bases controlling the manufacturing organization operation are becoming more electronic in nature. There may always be some aspects of com-

become a critical component of the manufacturing systems infrastructure.

Implementation strategies

The question manufacturing organizations must ask is not whether information management automation should be adopted, but how, where and when. World competition is forcing it, technology is permitting it, and our quality of life depends on it.

However, information management automation cannot be approached on a piecemeal basis. The key to successful information management automation is integration, and the key to successful integration is the application of advanced manufacturing systems concepts. An organization must analyze the overall flows of information and material to understand where opportunities for improvement exist.

ing system flow model, identifying sources and destinations of both information and material.

■ Modify the ideal model based on business constraints and develop an optimized manufacturing system flow requirement that determines the target environment for the organization.

■ Evaluate network architecture alternatives to support the required information connectivity and interoperability requirements of the optimized manufacturing system flows.

■ Implement the network infrastructure as the platform for the distributed systems that support information management applications.

■ Work closely with software vendors to customize integrated manufacturing data base systems to support the optimized manufacturing system flows.

Implementing information management automation can seem a daunting task due to the complex nature of the manufacturing environment. Developing a strategic plan for bringing information management automation into an organization can set the direction to follow for all involved departments, set standards for equipment and software, and define the tasks to be performed.

Information is the building block for manufacturers seeking to gain a competitive edge in this fast-paced global economy. By implementing information management automation throughout an organization, a manufacturer can expect to reap the benefits of improved quality, flexibility in product features and mix, lower cost through productivity gains and the ability to quickly bring products to market. ■

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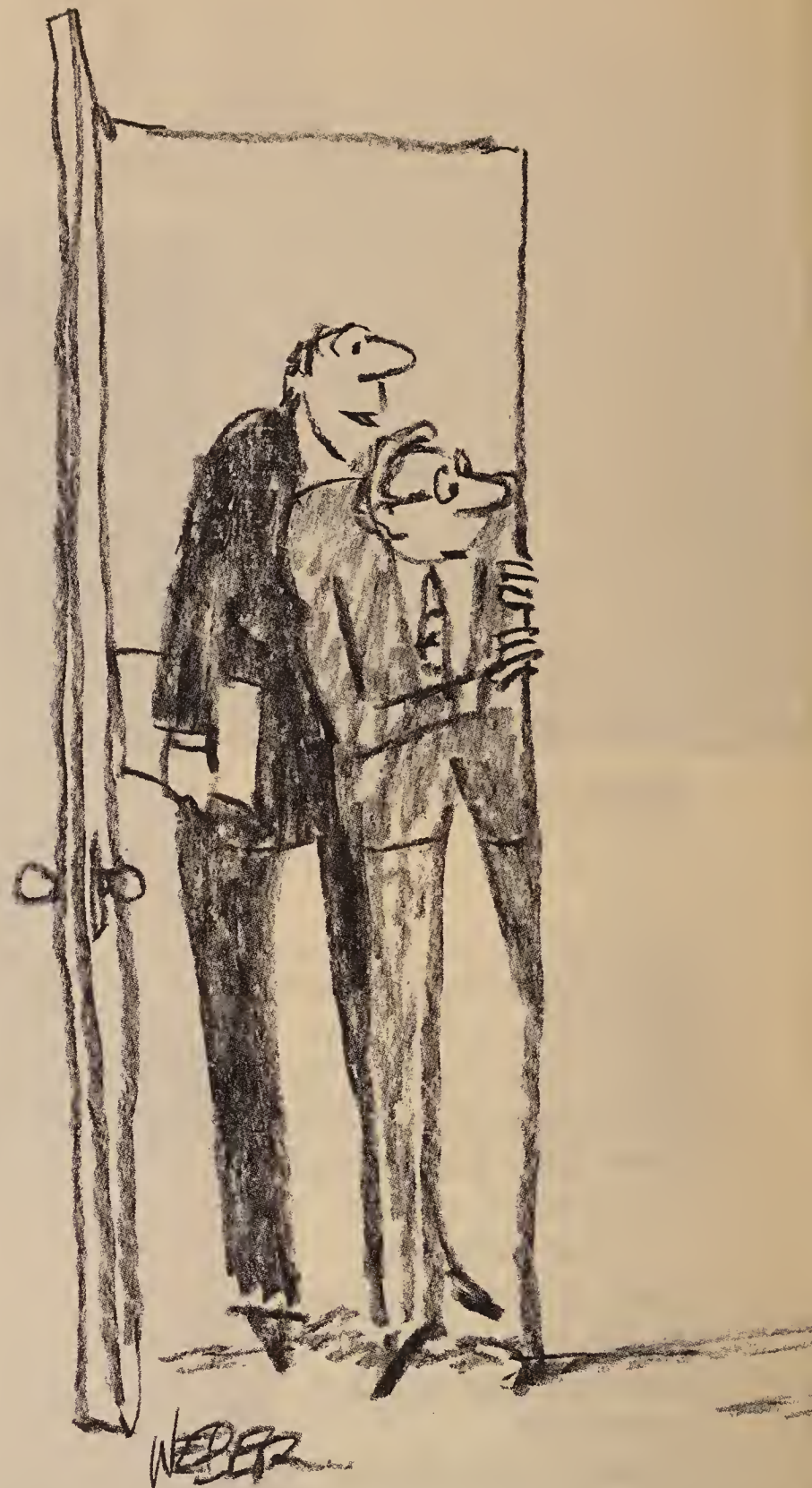
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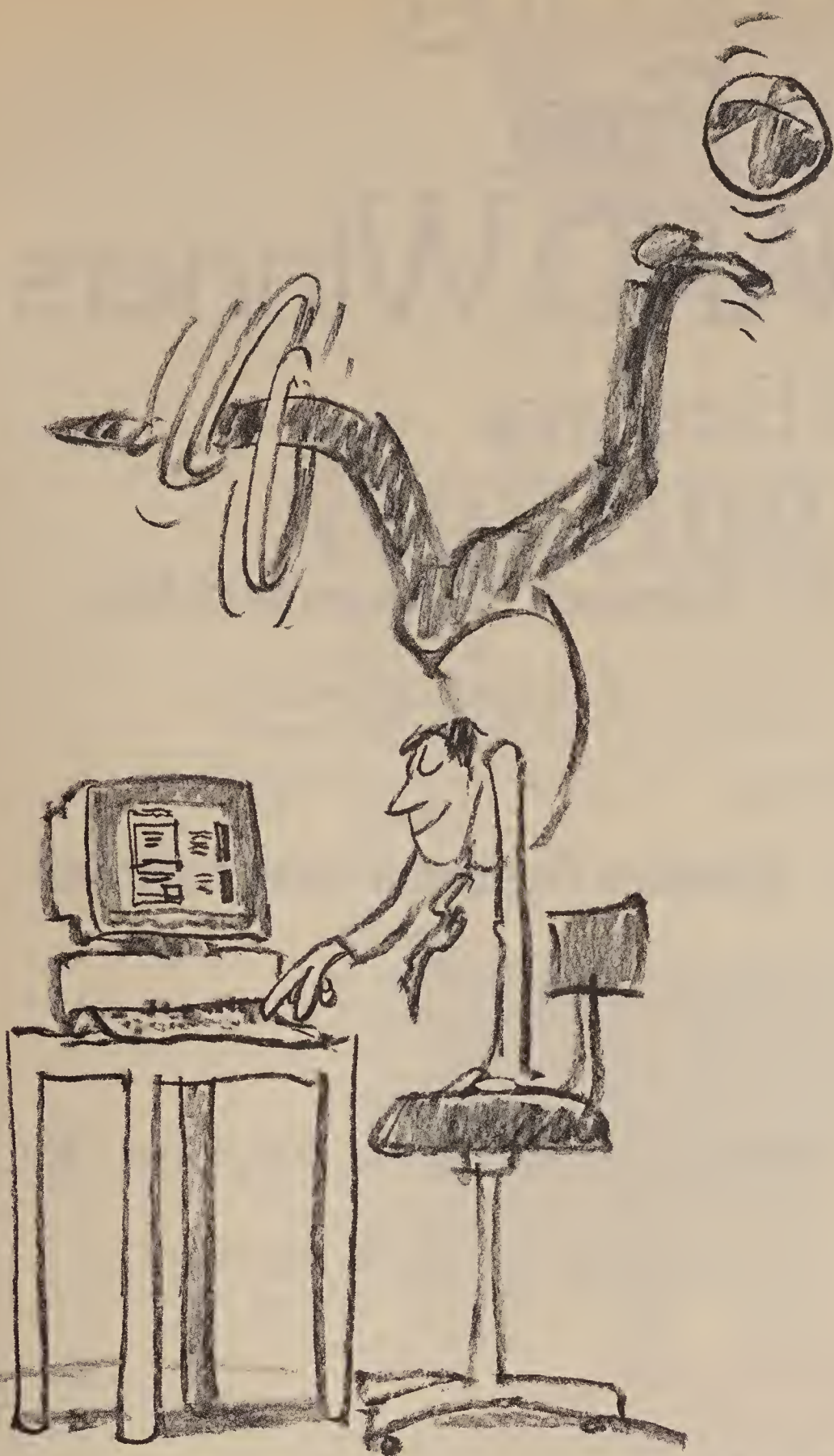


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Fighting back

Global competition is pushing manufacturers to adopt more efficient information-based management.

CONTINUED FROM PAGE 1
facturers earlier this year.

One U.S. company that dug its heels in and met the challenge of foreign competition is Milwaukee-based Allen-Bradley Co., a Rockwell International Corp. subsidiary that manufactures industrial automation and control systems. Pinched by foreign competition earlier in the decade, the company formed a task force to determine whether computer-integrated manufacturing (CIM) could save its motor contactor business.

After careful study, the task force reached a rather daunting conclusion: A CIM operation could produce motor contactors competitively if it was a completely paperless, peopleless environment that could reduce Allen-Bradley's typical 110 days worth of inventory to zero inventory. But the price tag for the project would be \$15 million to \$20 million.

The company made the investment and considers it money well spent. Designing the manufacturing process and the product simultaneously — a strategy generally referred to as concurrent engineering — resulted in a CIM system that reduced Allen-Bradley's reject rates on electromechanical parts from 3.5% of sales to 15 parts per million.

Two of their fully automated factories use an Oracle Corp. data base to coordinate four different

Breidenbach is Network World's West Coast bureau chief.



computer-aided design systems, an IBM mainframe-based accounting system, a Digital Equipment Corp. manufacturing data base and an assortment of computers on the factory floor.

"It wasn't a terribly technical challenge," says Tracy O'Rourke, Allen-Bradley's chief executive

officer. "It requires discipline more than space-age technology."

The biggest challenge was not coordinating robotics and other highly complex control machinery, it was integrating the company's information system with its factory control systems. The fac-

tory control systems were already doing a great job telling the factory machinery how to build a particular part, but the information system had to tell them exactly what part to produce, when to produce it and in what quantity, O'Rourke explains.

(continued on page 40)

(continued from page 39)

"To achieve this kind of integration, we chose a standard data base, but we wrote the rest of the software ourselves," he says.

Islands of automation

That's fine for a company like Allen-Bradley, which is in the computer automation business. However, firms that are strictly users of computer automation find integration jobs a big order. Many manufacturing firms have been busily installing "islands of automation" throughout their factories and enterprises for years.

"The biggest mistake many users make is that they don't first sit down and draw up a comprehensive plan," says Dan Steese, manager of manufacturing systems at Westinghouse Electric Corp. in St. Louis.

"They go out and see this technology and try it, and see that technology and try it. They don't have the larger view in mind."

Such users now must get these disparate systems to communicate with one another. And they seem to think software and systems vendors haven't been much help.

"I don't see the links being nearly as automated as one would believe from reading the advertisements of the software vendors," says Randall Gibson, president of Automation Associates, Inc., a consulting firm in Solana Beach, Calif. "The hardware is usually pretty standard, but you see a lot of custom software. The costs of making things work together are much higher than a lot of people might think."

But the costs of *not* making things work together — particularly the design and manufacturing processes — can be even

higher. "You have sophisticated 3-D workstations in the design area and machines on the shop floor that are so sophisticated, they're scary, but they don't talk to one another very well," says Andres Rodriguez, manager of aerospace defense industry marketing at Xerox Corp. "The design can change much faster than the documentation can get to the shop floor."

Traditionally, the design and manufacturing processes have been quite separate. A company's market research team comes up with a concept for a new product, which the design engineers turn into a blueprint. The designers would then "chuck their design data over the fence" for the manufacturing engineers to use. By the time the latter got through with the design, it often differed considerably from what the market research people originally conceived.

The back-and-forth alterations this type of arrangement requires are far too time-consuming in today's highly competitive world. It is difficult to break old habits, but the design and manufacturing people are reluctantly sitting down together. Once they actually start working in concert, however, a lot of the reluctance dissipates.

"Those barriers are coming down quickly, and it will be hard to tell the difference between design and manufacturing engineers in the future," O'Rourke predicts. "The conflict is between the managers, not the engineers. When the engineers start working on a problem, they really get into it and forget who is who."

One way to help them forget is to provide a common data base for the two groups to share. "We have the same file server connected to both the design and manufacturing networks," says a CIM specialist at a major defense contractor who asked not to be identified. "The same information is available to both groups simultaneously, and one can critique the other's work a lot faster."

Making this type of system work would

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"I don't see the links being nearly as automated as one would believe from reading the advertisements of software vendors,"

Gibson says.

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be fairly easy if all the engineering tools could be created from scratch with integration in mind.

However, the various engineering disciplines have automated tools already in place that represent far too large an investment to be discarded, says Laurie Bride, manager of network architecture for The Boeing Co. in Seattle.

Boeing is currently integrating hundreds of islands of information into a comprehensive whole designated as the Boeing Enterprise Network.

"Standards will allow us to have a flow of information throughout — not just transport standards, but graphics interchange standards like the Initial Graphics Exchange Specification [IGES] and the Product Data Exchange Specification [PDES]," Bride says.

The National Institute of Standards and Technology is currently taking IGES and evolving it into PDES, a much richer model for describing objects. PDES goes beyond giving the dimensions of a model part; it allows information about the design and manufacturing to be incorporated into the representation of the part. Therefore, the designer can make an intelligent decision that is based on the types of equipment available on a particular shop floor.

Suppliers' demands

Standards such as PDES are helping to integrate not only an organization's different parts, but its outside suppliers as well.

"In all these manufacturing environments, people are farming out projects. No

(continued on page 52)



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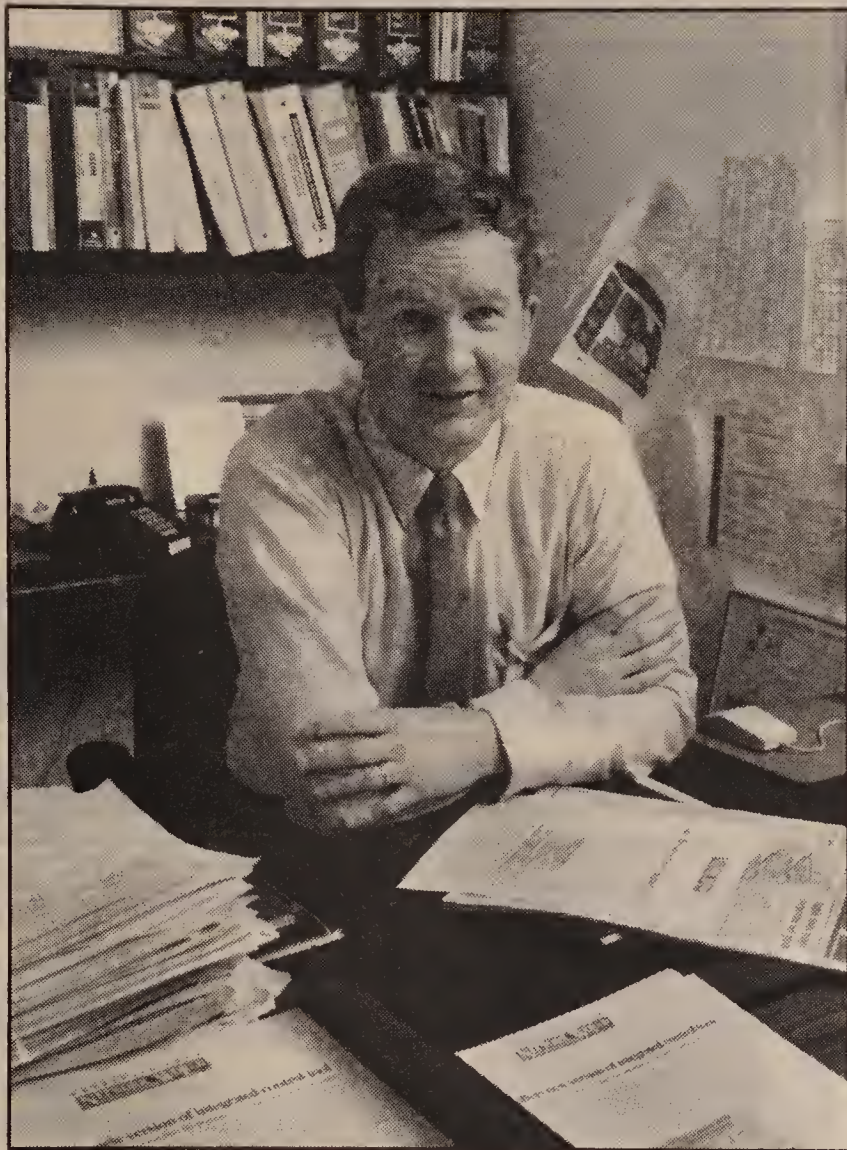


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Based in Canton, MA, Codex Corporation is a subsidiary of Motorola with 4,000 employees in 50 countries. It's the largest independent supplier of integrated networking equipment and systems. And, according to Chris Carroll, Media Relations Manager, keeping the marketplace up-to-date on the company's broad range of voice and data communications systems is no easy task. Fortunately, Codex gets lots of help from *Network World* editorial.

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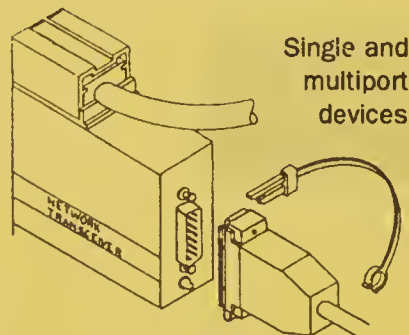


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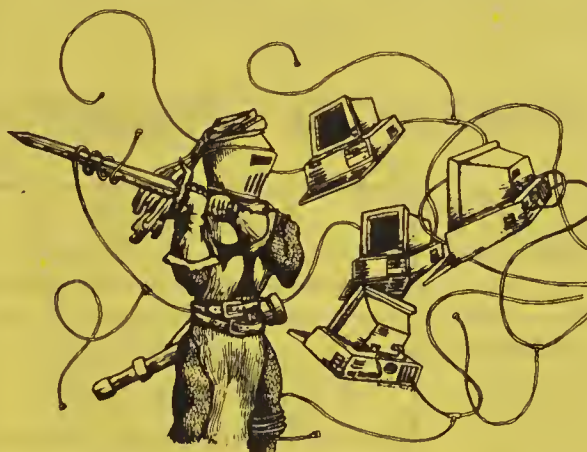
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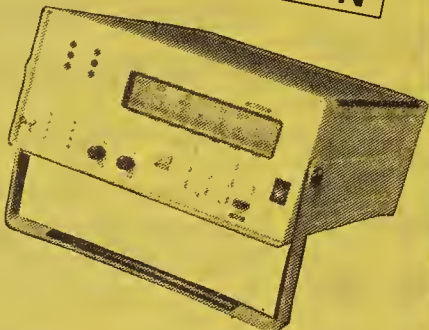
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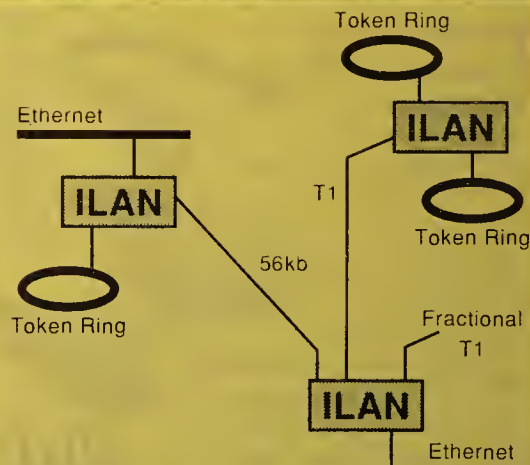
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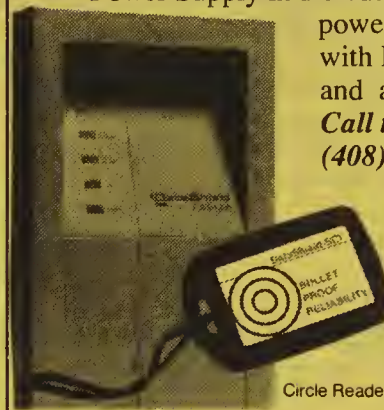
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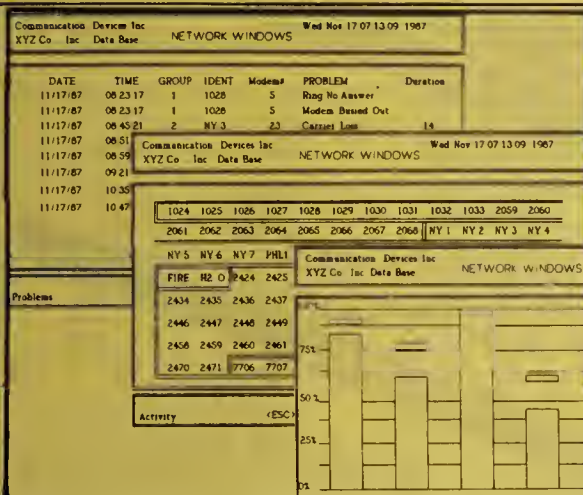
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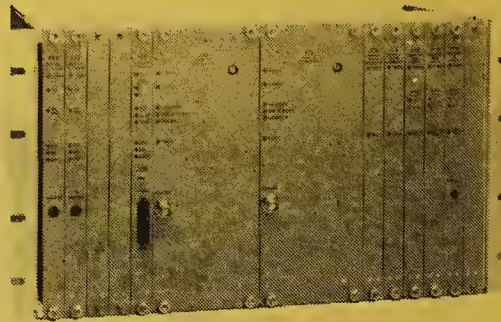
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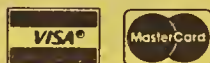


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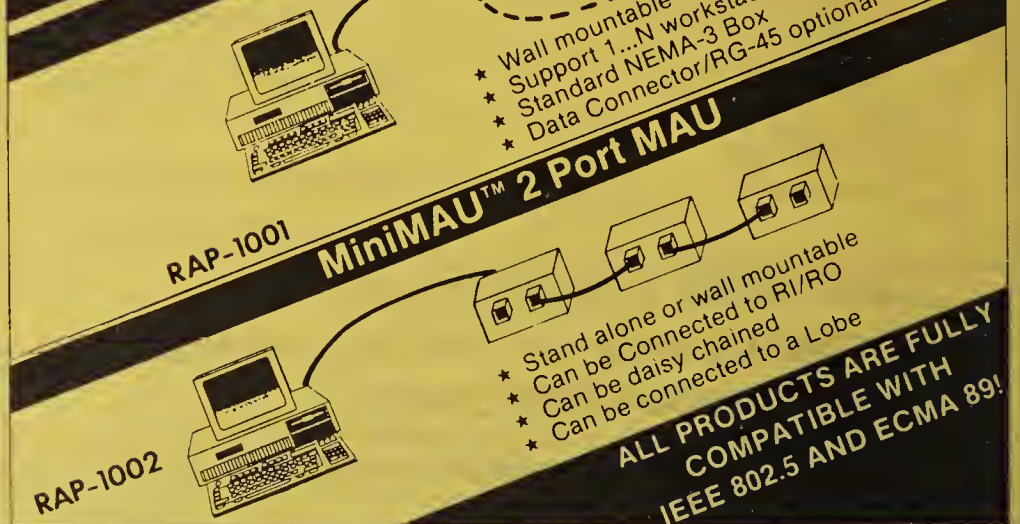
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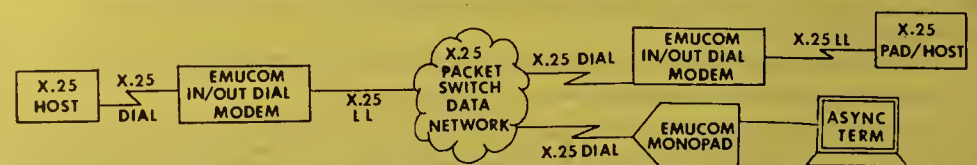
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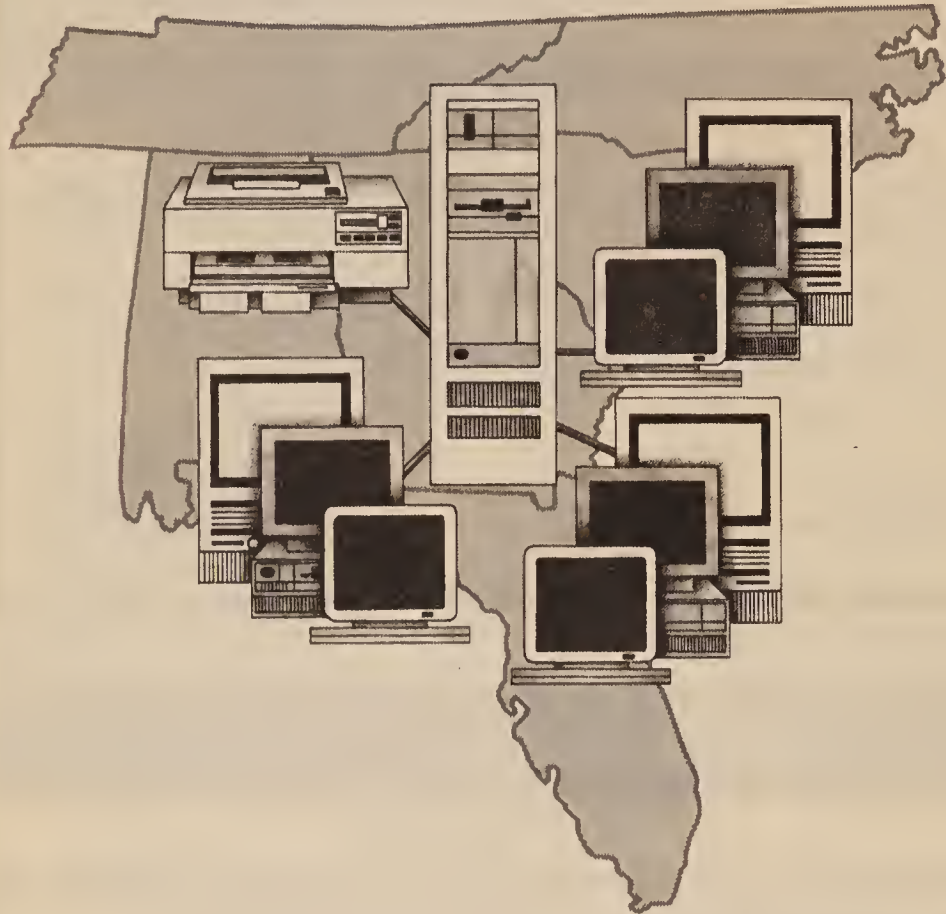
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 - 2. ☐ \$10,000 - \$25,000
 - 3. ☐ \$25,001 - \$50,000
 - 4. ☐ \$50,001 - \$100,000
 - 5. ☐ \$100,001 - \$250,000
 - 6. ☐ \$250,000 - \$500,000
 - 7. ☐ \$501,000 - \$1,000,000
 - 8. ☐ Over \$1,000,000

- 4. Number of employees in your company:** (check one)
- 1. ☐ Under 25
 - 2. ☐ 25 - 50
 - 3. ☐ 51 - 100
 - 4. ☐ 101 - 200
 - 5. ☐ 201 - 500
 - 6. ☐ 501 - 750
 - 7. ☐ 751 - 1,000
 - 8. ☐ Over 1,000

- 5. Number of employees in your company at your site:** (check one)
- 1. ☐ Under 25
 - 2. ☐ 25 - 50
 - 3. ☐ 51 - 100
 - 4. ☐ 101 - 200
 - 5. ☐ 201 - 500
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- 6. Number of workstations or PC's to be networked at your site:** (check one)
- 1. ☐ 5 - 10
 - 2. ☐ 11 - 25
 - 3. ☐ 26 - 50
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 - 8. ☐ Over 750

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 - 3. ☐ 500,001 - 1 million
 - 4. ☐ 1.1 million - 5 million
 - 5. ☐ 5.1 million - 10 million
 - 6. ☐ 10.1 million - 15 million
 - 7. ☐ 16 million - 50 million
 - 8. ☐ Over 50 million

- 8. Do you personally authorize the purchase of LAN equipment?**
- ☐ Yes ☐ No

- 9. In which ways are you involved in acquiring communication products (data, voice, and/or video) and services.** (check one)
- 1. ☐ Recommend/specify
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Oct. 2 - Datacom Buyer's Guide: Data Switches

Oct. 16 - LAN Buyer's Guide: LAN Servers

Nov. 6 - Datacom Buyer's Guide: Network Test Equipment

Nov. 13 - LAN Buyer's Guide: Ethernet LANs
- Comdex Fall Show Bonus Distribution

Nov. 27 - Telecom Buyer's Guide: VSAT Systems

Dec. 11 - Datacom Buyer's Guide: Packet Switches & PADs

Industry Focuses:

Sept. 18 - Industry Focus: Manufacturing

Oct. 9 - Industry Focus: Insurance

Oct. 30 - Industry Focus: Retail Point of Sale

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Nov. 20 - Network World Salary Survey

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(continued from page 40)

one is vertical anymore," says Vijay Chauhan, a manufacturing automation consultant for Arthur D. Little, Inc. in Cambridge, Mass. "You have to have your suppliers in your hip pocket. Every supplier is different, but the manufacturer has to be able to view each as one of its own shops."

The supplier's network must be able to call up and communicate directly with the manufacturer's network, obtaining manufacturing schedules and product specifications in real time, for example.

The supplier typically gets a generic description of the needed product and then designs it on a CAD system that is often completely different from the manufacturer's system. When the completed design is delivered in electronic form, there is a bottleneck as it gets translated into the manufacturer's format.

If the supplier were a user on the OEM's system and could get into the OEM's data base, it could respond to the manufacturer's needs more quickly.

That level of intercompany system integration outrages every instinct an MIS professional has, particularly in this age of computer viruses. For that reason, such integration is being held up by more than just incompatible graphics files.

However, intercompany communications at a somewhat lower level is being advanced as manufacturers — led by the automotive industry — hammer out a standard form of electronic data interchange.

EDI action

When the three major U.S. automobile manufacturers began to use EDI to communicate with their suppliers, they adopted three proprietary systems. This presented a problem for the suppliers: Most of them dealt with all three companies and were forced to support three different EDI systems.

Eight years ago, the suppliers banded together and formed the Automotive Industry Action Group (AIAG) as a standards-promoting organization and persuaded the automakers to join. The AIAG provides a forum for

together to determine what is needed. It then takes the results to ANSI, the official governing body for EDI standards. Tony Juncal, a spokesman for AIAG, says he figures that the AIAG's efforts have already saved the auto industry billions of dollars.

"The industry right now is at or near implementation of standard EDI and bar coding," Juncal says. Individual suppliers have no choice but to proceed with it now that General Motors Co., Ford Motor Co. and Chrysler Corp. are committed.

Just in time

While one standard EDI format makes life a lot easier for their suppliers, the Big Three auto makers also have their own interests at heart. Pressured by the Japanese, they are automating their business dealings with suppliers as part of an effort to implement "just-in-time" manufacturing.

In the just-in-time model, automation enables the manufacturer to reduce inventory to nothing, with products rolling off the assembly line and into awaiting trucks just in time to fill customer orders.

"EDI helps eliminate the need for us to inventory components from outside suppliers, and it helps the supplier avoid commit-

that can be issued daily, weekly or monthly and may be updated as often as necessary until an order is actually shipped.

Then, an advance shipment notice is sent by the supplier, informing Ford of when the conveyance leaves the supplier's shipping dock. When the shipment arrives, Ford issues a receipt while recording the number of items received as an accounts payable item. That information generates a check that is sent to the supplier.

Similarly, Chrysler is in the middle of a campaign that will ultimately automate all common business transactions with bankers, dealers and distributors, as well as with manufacturing suppliers. "A lot is on-line already, but we don't have full EDI yet," says Bill Harder, manager of material control development systems for Chrysler. About 2,000 suppliers are being required to submit business documents electronically in ANSI X.12 form.

"We've adopted those standards in cooperation with Ford and GM," Harder says. "By the end of the year, we will have implemented all major EDI transactions with our assembly business suppliers."

Chrysler started delivering manufacturing schedules electronically to one major supplier nearly five years ago and has gradually added others to the distribution list since. The manufacturer now has about 500 companies that are considered just-in-time suppliers and continually receive delivery schedules covering the next 10 to 12 working days.

"This has had a dramatic effect on our ability to compete," Harder says. "Our inventory turnover is now in excess of 60 [working days] per year."

The adoption of standard EDI communications is spilling over from the auto industry into other manufacturing sectors aided by suppliers that span them.

New Orleans-based McDermott International, Inc. has two subsidiaries that use a lot of steel to build steam generators and offshore drilling platforms. These two companies deal with the same steel suppliers as the auto manufacturers. Consequently, McDermott has implemented two

pilot ANSI X.12 EDI projects involving major steel companies.

McDermott was able to buy ready-made EDI software but had to write the interfaces between it and the purchasing systems used by the two subsidiaries. This type of customization is very expensive and could be avoided if the purchasing applications — and any other component of CIM — incorporated interfaces to networking standards such as EDI.

The cry for standards gets louder every year.

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"If systems developers and integrators were following standards more closely, users could pretty much pick and choose the products that meet their needs," says Glen Runyin, a spokesman for McDermott. "That's the whole point of standards — just plug and run without having to spend enormous amounts of time developing interfaces."

MAP/TOP

Such plug-and-play compatibility is the goal of Manufacturing Automation Protocol, which defines standards for the information streams that connect the various machines on the floor of an automated factory. MAP's corollary, Technical and Office Protocol, standardizes communications in CIM's other half — business activities and engineering design.

OSI and MAP/TOP networking had their coming-out party in June 1988 at the Enterprise Networking Event in Baltimore. There, attendees could see demonstrations of MAP/TOP 3.0 applications running across multi-vendor networks containing as many as 40 disparate computer systems.

Late last year, a six-year compatibility freeze was initiated mandating that any enhancements and applications developed during that time period had

to be compatible with MAP/TOP 3.0 as it was then defined. It was hoped that the move would convince a lot of the fence sitters in the user and vendor communities that MAP/TOP was finally stable enough to be implemented.

The cry for standards from users gets louder every year, and most vendors can't afford to ignore them. "This push from the user community will drive the smaller vendors who don't conform to standards out of the market," Runyin says. "But the big guys can drag their feet. IBM and DEC [two major suppliers of CIM technology] could stall for another couple of years."

Just how committed the "big guys" are to supporting MAP/TOP is a matter of debate. "Vendors will say they have a [MAP/TOP] product or are developing one," Runyin says. "But most of them have a vested interest in keeping their products proprietary." Of the major CIM vendors, only Hewlett-Packard Co. is currently offering MAP 3.0 products.

CIM

As both a user and vendor of manufacturing systems, IBM has turned its manufacturing facility in Research Triangle Park, N.C., into a CIM showcase. Dick Daugherty, general manager of the facility, attributes concurrent engineering efforts in particular to its success.

The level of just-in-time manufacturing achieved has virtually eliminated inventory, freeing up a lot of space. As a result, IBM has been able to consolidate much of its Southeastern manufacturing operations at Research Triangle Park while reducing its manufacturing work force at the facility by more than 400 people.

"We're totally systematized now and will be able to start implementing MAP in mid-1990," Daugherty says. The information systems for all of IBM's Southeastern region have been consolidated into a single operation, which will serve as a big beta site for MAP products. Meanwhile, IBM uses custom CIM software designed for the IBM environment, turning some of it into products and systems that are sold to other manufacturers.

DEC, which dominates indus-

“You have to have your suppliers in your hip pocket.”

▲▲▲

ting raw material and manpower to producing the wrong items," says Tom Bass, a product planning and control manager at Ford. According to Bass, Ford plans to implement 16 ANSI X.12 EDI transaction sets by the end of 1990.

Ford is already using standard EDI components to communicate with its suppliers, starting with a forecast of requirements that covers several months. They are also using a shipping schedule

Correction: The information for Verilink Corp.'s products was incorrect in the Aug. 28 Buyer's Guide. The following is the correct information.

NETWORK WORLD

Channel service units

Vendor	Product	Data rate (bit/sec)	Selectable pulse density	Extended superframe format compatibility	Data terminal equipment interface	Remote diagnostics	Error statistics gathered	Power supply	Price
Verilink Corp. San Jose, Calif. (408) 945-1199	551VST List 2 ESF CSU	1.544M	80 consecutive zeros	Yes, 54016 and T 1.403	T-1	Line, data, equipment and repeater loop-backs	ESF error events (errored seconds, severely errored seconds, bursty seconds, failed seconds) and alarms (excessive bit error rate, pulse density, bipolar violations, frame loss)	Line and internal	\$3,200

Data service units

Vendor	Product	Data rate (bit/sec)	Data terminal equipment interface	Secondary diagnostic channel	Digital data service-II secondary channel	Voice/data transmission	Net statistics gathered	Remote diagnostics	Price
Verilink	Adaptive Data Service Unit	1,200, 2,400, 4.8K, 9.6K, 19.2K, 32K, 38.4K, 64K	RS-232-C, CCITT V.35	Yes	No	Both	Bit error rate	Line, data and repeater remote loop-backs	\$2,450

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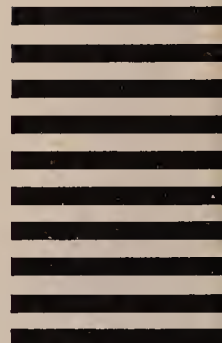
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trial networking with 45% of the market share, still dances around the subject of MAP a bit. The company recently issued an eight-page paper titled "Manufacturing in the 1990s: Enterprise Networking," which didn't refer to MAP. In addition, attendees at the recent North American MAP/TOP Users Group meeting in Toronto searched through the conference program in vain for any DEC participants.

The company has MAP 2.1 and MAP 3.0 products, but several users and systems integrators at the Toronto meeting reported that some of DEC's own salespeople are unaware of them. DEC's strategic product for networking multivendor manufacturing environments is its own Ethernet-based DECnet, not MAP/TOP.

"In manufacturing, standards are important, but what drives the market is the business problems users are trying to solve," says Toni Lee Rudnicki, a product marketing manager at DEC. "Many manufacturing environments are so unique that while there is a thrust for standards, they are not nearly as important as tools specific to a particular business."

Standards dilemma

It is difficult to choose between proprietary systems that are quickest at specific tasks and standard solutions that offer greater connectivity and flexibility.

Embracing something like MAP involves quite a leap of faith for the smaller manufacturers who are still feeling their

\$50,000 each to develop, and the whole process took at least six months. A manufacturing operation integrated in this fashion had to be completely reengineered when a piece of equipment needed to be moved or replaced.

By contrast, "if you have a broadband MAP network, you can move a machine anywhere as long as it has a MAP-compatible port," Kosmalski says.

MAP/TOP users

MAP/TOP practitioners in North America still make up a very small group, spearheaded by GM and Boeing. Last year, the North American MAP/TOP Users Group reorganized under the ITRC, a forum for defining user business requirements for standard technology.

Charter members of the ITRC are GM,

Boeing, Eastman Kodak Co., Aetna Life & Casualty, Apple Computer, Inc., HP and Xerox. Because there are still a number of industry segments not represented in the council, the ITRC is trying to recruit key companies to fill out its roster.

"We're out to convert a critical mass of North American companies," Manakas says. MAP/TOP is an American invention, but the Europeans are way ahead in implementing it and may in fact co-opt the standard. Recognizing this danger, both the U.S. and Canadian governments recently joined ITRC. "If we don't know what we're doing in cooperating with the Europeans, we'll end up eating what they dish out all the time," Manakas says. "They'll have the initiative."

Keeping a substantial piece of that initiative on this side of the Atlantic — and

Pacific — is an imperative for Mike Kaminski, manager of CIM networking on GM's advanced engineering staff. One of MAP/TOP's most outspoken advocates, Kaminski travels the country giving presentations to users and "trying to scare them" into action.

In his view, MAP/TOP reached a watershed after the Enterprise Networking Event last year, and it is critical that vendors start delivering products *now* and that users start implementing them. "What we do right now is going to determine whether we remain competitive in the world," he says.

Kaminski says he remains confident despite the odds that seem to be stacked against American manufacturers. "I'm bound and determined that we're going to win the fight." ■



On the surface, all earth stations are not alike.

way through the automation process. To meet current competition, firms are afraid to forego using the latest and greatest machines just because they don't comply with standards, especially when those standards don't bring any immediate benefits.

However, experts say this is a myopic view that could be fatal for users of manufacturing technology. "The impact of standards is something that creeps along. But when it really hits, it's going to put a lot of people out of business," says Ted Manakas, vice-president of marketing at the Information Technology Requirements Council (ITRC).

"The more you try to get people to understand it, the more they say, 'I've got a current problem here. Don't talk to me about some pie-in-the-sky standard.' They'll also tell you there are no open system applications available. That's true, but we have to start somewhere," he continues.

These same experts say that the cost of implementing MAP is not as high as many think, particularly in the long run.

"I don't think it's expensive at all," says Dan Kosmalski, director of CIM for Merit Systems, Inc. of Troy, Mich., which provides networking support and custom software to manufacturers. Kosmalski was a senior systems engineer at GM from 1976 to 1985, and he remembers how he used to get two dissimilar systems to communicate: hard-wire them together and write a device driver for each.

The device drivers cost \$30,000 to

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IBM takes part in interoperability display

continued from page 2

British token-ring vendor Madge Networks, Ltd. and a cofounder of OTF. "There's been a lot of tension [between OTF and IBM], but the IBM representatives were there first thing Monday morning and eager to get started with the setup. It's been a very comfortable relationship."

Other vendors whose products were represented in the demonstration were Andrew Corp., Apple Computer, Inc., Gateway Communications, Inc., Madge Networks, Memorex Telex Corp., NCR Corp., Novell, Inc., Proteon, Inc., Racore Computer Products, Inc., Texas Instruments, Inc., Tiara Computer Systems, Inc. and Western Digital Corp.

OTF's official charter is to help ensure

that token-ring network standards handed down by the Institute of Electrical and Electronics Engineers and other official bodies become standard, interoperable implementations.

Because of IBM's dominance in the token-ring market, its products currently are the de facto implementation standards.

Prior to formation of the OTF, non-IBM token-ring vendors made sure their products were compatible with IBM's but didn't test them with anyone else's, said Patrick Courtin, president and chief executive officer of Proteon, an OTF member.

Sharing war stories

"No matter how precise the standards

are on paper, they are open to interpretation," Courtin said. "We all have a lot of war stories to tell about it."

The OTF is supposed to help smooth the way to interoperability by providing a forum in which vendors can share information and learn from one another's mistakes.

Some say IBM has little to gain from joining OTF, but Madge disagrees.

"I truly believe it is better for IBM to have users believe there are a lot of compatible products out there," Madge said. "It makes the token-ring market look a lot more stable. Without things like this OTF interoperability demonstration, people get the impression that [token ring] is proprietary."

User impressions are important to the OTF, which is also trying to get users to

join. At a recent OTF meeting in St. Louis, a panel discussion by four users was very successful but the vendors in the audience were the primary beneficiaries.

"We want to see users get more benefits," Madge said. "We need to get more users in the audience as general participants." Consequently, the next OTF forum, scheduled for January, has a theme dear to users' hearts: network management.

By next year's NetWorld show in Dallas, the OTF hopes to be demonstrating both 4M bit/sec and 16M bit/sec token-ring interoperability, as well as multivendor 100M bit/sec Fiber Distributed Data Interface over token ring. "Right now, the standard isn't quite done, but we're expecting a spate of FDDI announcements," Madge said. □

T-1 group to study controversial plan

continued from page 2

In a presentation here, William McNamara, technical standards manager for BellSouth Services, dismissed user concerns about service interruptions and the need for repeaters.

"Over an installed base of well over 10,000 [T-1] access lines, I am unaware of a single case where service was not brought to within 200 feet of where the customer requested it," McNamara affirmed.

Several users at the conference, however, raised concerns about how smart jacks may affect their nets. "Installing smart jacks adds another unnecessary component to the network," said Alex Weresow, corporate communications director for Sterling Drug, Inc. of Montvale, N.J. "It makes the network more difficult to manage and represents another possible point of failure."

ITUA members suggested BellSouth redesign the smart jack by moving the LBO out of the transmittal path to eliminate the possibility of interference.

"That would seem to eliminate the possibility of the smart jack interfering with the signal and would go a long way toward allaying user concern," said Ray Beavan, communications manager for LTV Steel Company, Inc. in Cleveland.

But Charles Johnson, chairman of the board for General DataComm, said in a briefing here that smart jacks could interfere with on-site equipment, a violation of the FCC's Third Computer Inquiry. □

Letters

continued from page 31

tor trailer in Philadelphia. Within two hours of the tractor being stolen, the police and Federal Bureau of Investigation apprehended the thieves with the cargo, which was valued at more than \$140,000.

Yong Lee
President and
chief executive officer
Pegasus Message Corp.
Herndon, Va.

Author's reply: In the story to which Mr. Lee refers, a user who had tested Pegasus products was quoted regarding the results of those tests. Network World quoted the user accurately and stands by the story.

Network World attempted to reach Pegasus officials for a rebuttal but was unable to do so by press time.



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Stage is set for an ISDN showdown

continued from page 1

first long-haul carrier to announce an ISDN tariff for the Primary Rate Interface, which it introduced in April 1988. But user demand for ISDN is not expected to blossom until the mid-1990s, so the late arrival of MCI and US Sprint should not handicap them too badly, industry watchers said. Both US Sprint and MCI have promised to have ISDN services available in the first quarter of next year.

US Sprint, which introduced Primary Rate Interface last month, was the last of the three carriers to announce its entry into the market. Besides primary rate support, the company announced five ISDN features, including ANI and ISDN access to its Telenet Communications Corp. subsid-

iary's packet-switching network ("US Sprint trumpets ISDN rollout plans," *NW*, Sept. 4).

Although US Sprint's services will be available from each of its 268 points of presence (POP) nationwide from the outset, the carrier will be supporting them from only two ISDN-capable central office switches, probably located on the East and West coasts.

Users will be linked to the ISDN nodes via long-distance T-1 pipes configured to support the Primary Rate Interface. Although the links will pass through local US Sprint POPs, the traffic will not be switched until it reaches one of the two ISDN nodes.

Services will be charged as if the calls

had originated at customers' local serving offices. "The entire process will be transparent to the user, thanks to the flexibility of our fiber network," said Gerry Canavan, US Sprint's director of enabling technologies. The two switches should be adequate to meet customer demand for at least two years since ISDN acceptance will grow slowly at first, he said. The carrier will upgrade more switches as needed.

Analysts were optimistic about US Sprint's deployment strategy, which differs from that of AT&T and MCI, which plan to upgrade local switches on a city-by-city basis.

"US Sprint's strategy is clever," said Paris Bursytn, director of telecommunications research for Business Research Group, a research and consulting company in Boston. The carrier is waiting for de-

mand to ramp up before spending the money to upgrade its switches, he said.

In contrast to US Sprint, AT&T expects to have 73 switches upgraded for ISDN by year end and 110 by the end of next year. According to John Kauza, AT&T's manager of ISDN and Signaling System 7 (SS7), AT&T's arrangement is preferable to US Sprint's because the ISDN POPs are spread out.

"If you focus on one or two places, your risk of having a problem compounds the customer's problem," Kauza said. If one US Sprint node goes down, the other could be overrun with traffic. "By having a geographically displaced service, you eliminate that risk."

A bigger advantage for AT&T, though, is the head start it has on ISDN. AT&T has signed up 30 ISDN customers and has 200 more waiting for service, Kauza said.

"Our ISDN customer base is teaching us what we should do next," he said. "Our competitors do not have this resource yet. So by the time they get to Phase I of their ISDN rollout, we'll be starting on Phase II or III."

Analysts agreed that AT&T's early entrance gives it an advantage.

"AT&T has always been at the forefront of ISDN," said Charles Nichols, a vice-president at the Boston office of Prudential-Bache Securities, Inc. "They've put in a lot of time and money for ISDN research and development."

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When MCI announced its ISDN strategy last May, the carrier focused largely on what it referred to as "ISDN-equivalent services" that use in-band rather than out-of-band SS7 technology. Its 800 Enhanced Service Package, for example, gives customers the benefits of ANI without ISDN signaling or equipment.

MCI promised to offer a full range of true ISDN services, including call-by-call service selection, by early next year. The carrier plans to make all of its switches ISDN-compatible by the end of next year, according to Dean Johnson, MCI's ISDN product manager.

Still, MCI's original ISDN announcements left some industry watchers with the impression that MCI is the ISDN laggard of the Big Three. "MCI is seeing where the market's going rather than driving it," said Bob Wilkes, a telecommunications analyst at Brown Brothers Harriman & Co., a New York-based brokerage firm.

Johnson disagreed, saying MCI's involvement with ISDN-like services "in no way has taken away from our development of ISDN services."

Indeed, some analysts applauded MCI's strategy. They said MCI realized that ISDN services, not the technology, are what users care about.

"What MCI is doing is smart since ISDN will be market-driven, not technology-driven," said Steve Kropper, a telecommunications analyst with International Data Corp., a Framingham, Mass., market research firm. "MCI is focusing on what customers want today. Many customers aren't ready to invest in the equipment needed to support ISDN, so ISDN-like services are the next best thing." □

20M bit/sec Arcnet bows

continued from page 6

installation Arcnet is known for, and ArcnetPlus adapters will interoperate with existing Arcnet cards on the same local network.

This is in contrast to 16M bit/sec token-ring adapters, which — unless they are locked into 4M bit/sec mode — cannot interoperate with first-generation 4M bit/sec token-ring adapters.

The interoperability between the two versions of Arcnet is achieved by dynamically varying the data signaling rate.

ArcnetPlus has a "capability table" that ArcnetPlus nodes can use to find out what speed other nodes support. The table is auto-

matically filled as ArcnetPlus examines the signaling elements transmitted by each of the nodes during the first complete token loop after the network is configured. The table is cleared and re-filled when ArcnetPlus detects a reconfiguration.

The ability to mix adapters of two different speeds on the same network means people will be using ArcnetPlus to tune, not replace, their Arcnet networks, said Geof Karlin, director of marketing for SMC's systems division.

"On the typical LAN today, the 80/20 rule is in effect: 20% of the nodes are doing 80% of the work," he said.

Thus by upgrading that 20% and the server to ArcnetPlus, 80% of the traffic on the network

will be sped up by as much as eight times.

In addition to the added speed, ArcnetPlus has a number of other enhancements over 2.5M bit/sec Arcnet. The maximum-node limit on a single local network has been increased from 255 to 2,047.

ArcnetPlus also supports the 48-bit address format and Media Access Control-layer interface dictated by the IEEE 802.2 Logical Link Control standard, making ArcnetPlus compatible at the link layer with any net that complies with the 802.2 standard.

Another new feature is support of the 32-bit address format in the IP portion of Transmission Control Protocol/Internet Protocol. **■**

Banks fight for the lead

continued from page 1

& Lybrand survey of 200 major manufacturing companies, most companies plan to either receive or initiate electronic payments with trading partners in the next two years. Half of the companies surveyed are testing EDI payment systems with as many as 10 trading partners, and all expect to greatly expand that number in the next two years.

The U.S. government and major users such as General Motors Corp. have fueled the movement toward EDI-based corporate trade payments by insisting that suppliers and their banks be able to receive electronic payments.

A lot on the line

Observers say banks that don't modify their payment processing services to accommodate electronic payments might lose significant revenues.

"Banks that don't offer a full range of [electronic payment] services risk losing their major corporate customers," said Marcia Kaplan, an independent market analyst who recently completed a report on EDI for Market Intelligence Research Co. in Mountain View, Calif.

Successful banks will give cus-

tomers a wide range of services to make it easy for them to begin making electronic payments.

"The name of the game is to be flexible and accommodate what the customer wants," said Jane Lohmar, assistant vice-president at The First National Bank of Chicago, one of the first banks to offer electronic payment services.

Banks that receive payments for customers must be able to handle a variety of electronic payment formats as well as paper checks and remittances. Banks then must be able to consolidate these payments and transmit them to the customer in whatever format the customer desires, Lohmar said.

For example, a company might want its bank to transmit payment information in an electronic format developed by ANSI, known as ANSI 820. But payments to the company might come in as paper checks, National Automated Clearinghouse Association corporate trade payment formats and Federal Reserve System wire payments.

The bank must be able to process all those payments and transmit payment information to the company's accounts receivable system in the 820 format. First Chicago offers a service called Comprehensive Receivables that does just that, Lohmar

Kit wins key vendor backing

continued from page 7

tem, Banyan VINES, AT&T Starlan and 3Com 3+ Open environments.

"In effect, we're removing the 'Tower of Applications Babble' that currently exists and replacing it with 'Esperanto' applications that can be accessed by users regardless of the operating system or transport protocol," Fowler said.

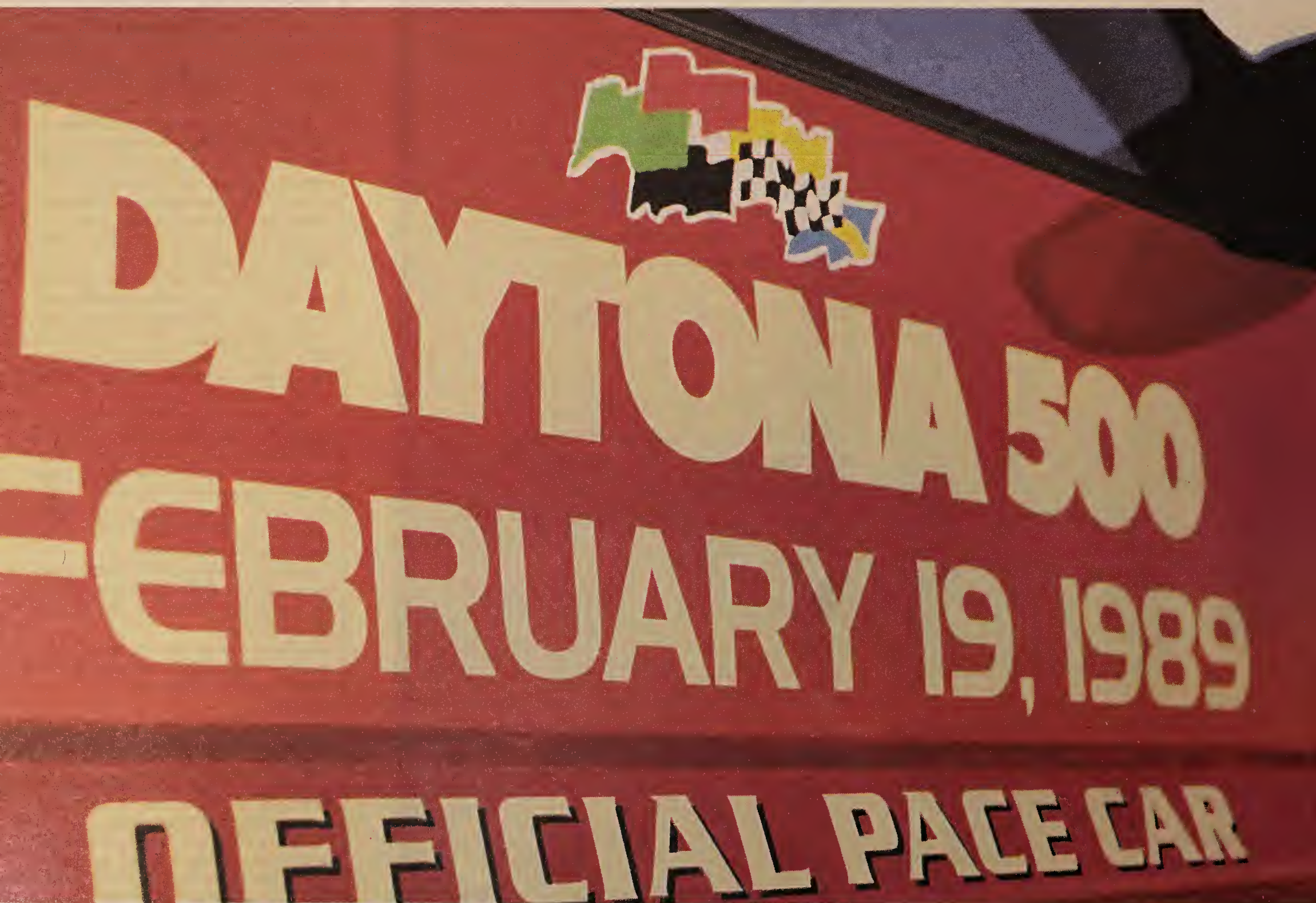
"Ultimately, end users will get applications that are richer in functionality since they won't be constrained by the limitations of a specific operating system environment," he added.

Besides Banyan, 3Com and AT&T, the tool kit is backed by 16 other leading software developers and systems vendors, including Ashton-Tate Corp., AST Research, Inc., Informix Software, Inc., Interactive Systems Corp., Lotus Development Corp., Oracle Corp., Relational Technology,

Inc., Sybase, Inc., Unify Corp. and Wang Laboratories, Inc.

Banyan President David Mahoney made the decision to back the implementation of the common RPC TOOL because it will simplify the process and reduce the cost of developing applications for multivendor environments.

"The LAN industry needs standards, and this is a big first step," Mahoney said. "It's a win-win situation for network vendors, developers and end users alike." **■**



said. The bank also offers a comparable service that lets customers initiate electronic payments to suppliers.

First Chicago is also trying to stay ahead of the competition by adding new payment services. Anticipating a large upswing in international trade, the bank plans to offer customers the ability to exchange electronic payments with customers outside of North America by mid-1990. Payments will be made in the ANSI 820 format initially. Later they will be made using the EDI for Administration, Commerce and Transport standard as the appropriate message sets are developed, Lohmar said.

An EDI traitor?

Banks are competing not only with one another to provide electronic payments, but with large VANs that already offer users a wide range of EDI services.

"Banks are legitimately worried that VANs will take away a sizable portion of their payment processing business," said Randy Kahn, electronic funds transfer business unit manager at First Interstate Bancorp in Los Angeles.

Although only banks can credit and debit customer accounts, the VANs can compete with banks for such services as collecting, consolidating and transmitting

payment and remittance information. Many cash management banks earn considerable revenue by conducting these transactions for customers.

While most banks see the VANs as formidable competition, First Interstate said it believes it can benefit from the VANs' expertise in networking and EDI services.

In June, First Interstate unveiled an electronic payment service using mainframe-based EDI translation software developed by GE Information Services, one of the world's largest value-added EDI service providers. First Interstate remarks GE Information Services' network services to customers that don't already have a means to transmit EDI information to trading partners or banks. Called The Bank Payment System, the service already has 200 customers and is growing rapidly, Kahn said.

"A lot of people [in the banking industry] are calling me a traitor, but I like to think we are the industry's pacesetter," he said. "We saw a real strategic advantage in combining the payments expertise of a bank with the EDI and network resources of a VAN. Other banks are beginning to see we might be right." ■

Senior Editor Bob Brown contributed to this article.

Unisys picks net to slash costs

continued from page 1

tems Corp. and General Data-Comm, Inc.

The Unisys Tariff 12 contract is valued at a minimum of \$16 million per year, or \$80 million over five years. The deal is expected to generate \$100 million in business over five years, Haerland said. The network will link over 300 Unisys locations including manufacturing sites, customer support centers and company headquarters here.

Following a trend that is becoming more common in Tariff 12 deals, Unisys will get a custom billing plan that allows it to track costs by region, organization or other criteria, and to highlight any changes. "Today, we get a truckload of bills every month, and we're having a great deal of difficulty figuring out what's in there," Haerland said.

The Unisys contract also calls for AT&T to expand Unisys' current network, which uses mostly AT&T lines, from about 40 T-1 lines to 93, he said. Unisys' T-1 backbone will be extended to include traffic now carried over 4.8K, 9.6K, 14.4K and 56K bit/sec lines.

Altogether, data capacity will more than double, while total

data transmission costs will drop by 30% and the number of data circuits will be reduced from about 700 to 300, he said.

Unisys will increase its use of SDN service to bring the number of sites served by SDN up from about 150 to nearly 300, Haerland said. But its voice costs will be cut 70%, both by bringing more sites onto the private T-1 backbone and because usage-sensitive rates will fall from the current rate of 15 to 16 cents per minute to an average of 10 cents per minute.

Unisys will initially get a discount of about 30% on international calls, although that figure varies by country called, Haerland said. When AT&T's Global SDN service becomes available this fall, Unisys will save about 50% on calls placed between the U.S. and the U.K. and will have seven-digit dialing between the two countries.

Domestically, Unisys' lowest daytime call rate will be 5½ cents per minute for on-net switched calls of under 300 miles. The highest will be 10.3 cents for calls over 4,200 miles.

Unisys will get a volume discount of 10% for charges between \$10 million and \$20 million per month, and 12% for charges of over \$20 million per month, he said.

In selecting AT&T, Unisys rejected aggressive bids from MCI Communications Corp. and US Sprint Communications Co.

"The real deciding factor was that we could get our savings much quicker with AT&T because they are the incumbent," Haerland said.

Another reason Unisys went with AT&T was the network management service the carrier offered, he said. Today Unisys has to call an AT&T service center when it has a network problem, and representatives there contact the service personnel who actually address the problem. Under the new contract, Unisys will be given direct access to AT&T technicians.

Unisys will be the third beta site, in addition to AT&T's internal network, for the Integrator. The Integrator, which is based on an AT&T 3B2 minicomputer and a Sun Microsystems, Inc. workstation, is already installed, and Unisys is in the process of loading equipment data into its data base.

That data is used not only to keep a comprehensive inventory of network equipment but also to create graphic representations of network configurations. In addition, it is used to support the Integrator's correlation feature, which can help determine the cause of a major net outage. ■

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AT&T

The right choice.

DG puts teeth into its network strategy

continued from page 1

Migration to DAA is intended to give the company a role in the market for local network-based client/server applications, Forgione said. It is also intended to help the company sell more of its minicomputers as well as its personal computers based on Intel Corp. 80286 and 80386 microprocessors.

Forgione said DAA is based on a client/server model where processing is distributed between workstations and servers. Clients can be workstations running DOS or OS/2, while servers are MVs. Eventually, AViiONs will be supported as both servers and clients, he said. AViiONs are powerful workstations based on the Motorola Corp. 88000 Reduced Instruction Set Computer (RISC) microprocessor.

"Essentially, the environment allows you to mix and match," he said. "We call it our strategy to deliver freedom of choice."

Today, DG will announce its first DAA-compliant products.

The first, Comprehensive Electronic Office (CEO) Object Office, is an icon-based graphical interface based on Microsoft Windows/286 and Hewlett-Packard Co.'s NewWave. The product runs on both the minicomputer and the workstation and lets users access functions — including electronic mail, filing and print services — supported by DG's minicomputer-based CEO office software by clicking icons shown on the screen.

CEO Object Office extends that interface to DOS-based applications, enabling users to cut data or graphics from one application and paste them into another, no matter where the application resides. Also, CEO Object Office's Object Management Facility lets users establish links between objects.

Initially, CEO Object Office will work only with DG's Personal Computer * Inte-

gration (PC*I), an IBM Network Basic I/O System-compatible local net tool, which links workstations to servers over Ethernet, Starlan and token-ring networks.

"We intend to support the majority of installed LANs — IBM Token-Ring, Novell or OSI," Forgione said. "We have a commitment to support LAN Manager as well. But we're not going to bring our own proprietary network operating system or LAN protocol stack to the marketplace. We're going to coexist with what is out there."

Analysts expect DG's strategy to focus on its AViiON workstations because they offer a price/performance ratio of about \$500 per million instructions per second.

According to Cliff Conneighon, pro-

gram director for office information systems service at Stamford, Conn.-based Gartner Group, Inc., DG will use RISC as part of its strategy to distinguish its client/server products from IBM's OfficeVision and Digital Equipment Corp.'s Network Application Support products.

Intellibook software

The other DAA-compatible product DG will announce today, Intellibook software, is a hypermedia-based electronic document product licensed from Owl International, Inc., said Jerry Goguen, product manager for work group software at DG. Hypermedia gives users the ability to create indexes to help them find data on large data bases of text, graphics and images.

The personal computer software helps users sort through documentation by es-

tablishing links between related documents, similar to the way a library card catalog works, Goguen explained.

Available 90 days after receipt of order, Intellibook Author software, for creating hypermedia-based documents, starts at \$1,295. Intellibook Reader offers read-only access to documents and costs \$295.

CEO Object Office is available 60 days after receipt of order. The personal computer package, which requires a personal computer with at least an Intel Corp. 80286 processor and 3Mbytes of memory, costs \$400 for the version with NewWave support and \$545 for the version that supports both NewWave and Microsoft Windows/286 2.11.

CEO Object Office host software ranges from \$375 to \$4,335, depending on the MV processor used. □

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Source: 1989 Harvey Research Organization, Inc.

NETWORK WORLD

The Newsweekly of Enterprise Networking Strategies
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T-1 users discuss new trends in technology

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out the cost savings you attained by using that network topology," Held said.

When fractional T-1 becomes a universal service offering and when users take a hard look at its pricing, they may begin adding redundancy to their nets, Held said.

Cable & Wireless North America, Inc., Williams Telecommunications Group, Inc. and AT&T have already introduced fractional T-1 services. US Sprint Communications Co. and MCI Communications Corp. are expected to announce them shortly.

Although fractional T-1 services promise to provide economical redundancy for T-1 nets, many Independent T-1 Users Association members use traditional offerings in their disaster recovery plans.

Midlantic Corp., an Edison, N.J.-based banking firm, uses a combination of diverse routing and hot sites to back up the check processing and retail banking applications supported on Midline, its three-state private T-1 network.

But even this detailed disaster recovery plan cannot insulate Midlantic from all service interruptions. Last fall, a railroad construction crew working in northern New Jersey accidentally severed AT&T's main Atlantic seaboard fiber link.

"It took AT&T about 10 hours to fix the problem, [but] we were able to recover 90% of our banking operations in six hours," said James Murphy, manager of net communications engineering for Midlantic subsidiary Midlantic Banks, Inc. □

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